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ABSTRACT

A credential called the Child Development Associate (CDA) was the focus of this study. Based on the competence of child care staff, it offers two benefits: it may be fair and accurate without resorting to impractical requirements of education and experience, and its recognition may benefit workers' careers. Credentialed and noncredentialed groups of staff were compared on interview responses, test scores, and job supervisor ratings. Also included was a review of related occupations and of the relationship of state child care regulations to the CDA credential. Results of the study indicated that accurate judgments about staff qualification are feasible with a competence assessment like the CDA, but also suggested ways in which the accuracy of the credential procedure might be improved. Given the absence of more differences between the groups, the CDA cannot be used as the sole indicator of ability. Few findings suggested career development benefits from the CDA, perhaps due to limited opportunities within child care. The results suggested possible future career opportunities for CDAs. As a policy to enhance child care quality, the CDA must be viewed as one among many policy alternatives. (Author/GK)

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FINAL REPORT FOR

GRANT NUMBER NIE-G-78-0003

Career Development Potential and Validity of a Competency Based Credential for Child Care Staff

prepared by

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SUMMARY ABSTRACT

A credential called the Child Development Associate (CDA) was the focus of this study. Based on the competence of child care staff, it offers two possible benefits; it may be fair and accurate without resorting to impractical requirements of education and experience, and its recognition may benefit workers' careers. Credentialed and noncredentialed groups of staff were compared on interview responses, test scores, and job supervisor ratings. The study also included a review of related occupations and of the relationship of state child care regulations to the CDA credential.

Results of the study indicated that accurate judgments about staff qualification are feasible with a competence assessment like the CDA, but also suggested ways in which the accuracy of the credential procedure might be improved. Given the absence of more differences between the groups, the CDA cannot be used as the sole indicator of ability. There were few findings to suggest career development benefits from the CDA, perhaps due more to limited opportunities within child care than to inadequacies of the CDA itself. The results suggested possible future career opportunities for CDAs. As a policy to enhance child care quality, the CDA must be viewed as one among many policy alternatives.

UTILIZATION OF THE RESEARCH

Because of its very applied nature, this research should directly affect practices relating to child care program design, regulation and staff development. At the same time, the principal investigator has attempted to link all aspects of the research to broader theoretical and policy issues; these links should expand the utility of the research beyond short term practical applications.

Findings of the research have already been used to inform policy makers at the federal and state level, by dissemination through a moderately technical summary report monograph. The principal investigator has consulted directly with the Executive Director of the CDA Consortium and with credentialing officials in the state of California. More consultations are planned when the CDA Consortium indicates readiness to review and modify its procedures.

Further utilization of the research is described in sections of the final report entitled "Dissemination of Research Findings," and "Suggestions for Future Research." As noted in the grant proposal, this research project was intended to be exploratory. Its utility will be demonstrated as it serves as a base for further research.

RESEARCH COLLABORATORS

Shirley C. Karas, M.S. Assistant Professor and Coordinator of Contractural Programs for the Child Development Department. She served as project director for the duration of the grant.

Joy Menne, Ph.D. Central Iowa Associates, Inc. She was a consultant on research methods for the duration of the grant.

Willa Bowman Pettygrove, Ph.D. Assistant Professor in the Child Development Department. She was the principal investigator for the grant.

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Alice Woods. Graduate research assistant, Child Development Department. She was the research assistant from June, 1978 to October, 1979.

FINAL TECHNICAL REPORT SUMMARY

The Child Development Associate (CDA) is a competency based credential and assessment system. Its purpose is to verify the ability of persons to work with groups of three to five year old children in child care centers. The need for such a credential was indicated by the growing demand for out of home care for children, and by the difficulty of developing and assessing the skills of the many employed caregivers who lack appropriate credentials or degrees.

The purposes of the research reported here were to investigate the CDA assessment's accuracy in identifying competent child care staff, and the practical value of the credential for promoting their career development. Accuracy was evaluated by statistical tests of validity and by investigating features which might interfere with some applicants' access to the assessment. For career development potential, the study focused on career changes in credentialed and uncredentialed staff. Career development aspects of the credential were also studied in terms of potential job opportunities and the credential's effect on child care licensing.

Three sets of data were collected to investigate the assessment/credential system's accuracy and practical value. One set included interviews, a written assessment, and job supervisor ratings for approximately 180 credentialed and noncredentialed child care workers in ten midwestern states. Rating data from the CDA assessments of credentialed subjects were also included in the set. A second set of data, subjected to a content analysis, was literature containing job analyses or competence definitions for occupations related to child care. A third set of data was interviews with

state officials and child care professionals. This last set of data resulted in two case studies on the changes in regulations related to the innovative CDA credential.

The data provided by child care staff was taken over a two year period in order to allow for possible changes in career patterns. Because persons were not randomly selected or assigned to experimental or control groups, observed differences or changes could not be interpreted as proof of the CDA credential's impact on performance or career development. Given the newness and voluntary nature of the credential, it was possible that the noncredentialed group also contained many competent individuals. In addition, there were systematic differences between the groups in age, ethnicity, education, and family status which could influence other statistical relationships. In spite of limitations on the field data, a number of interesting findings resulted from the analysis.

Credentialed subjects performed significantly better than noncredentialed ones on two of six subscores on the written assessment, even when differences in educational background were controlled. Because the content of the written assessment was based on the CDA competencies, this finding may reflect some differences in ability. It cannot be taken as an index of actual performance, however.

The data from supervisor ratings were analyzed with data from the assessments of credentialed subjects. The average interrater correlations from this analysis were significant for all thirteen CDA functional areas (competency indicators). Although not supporting high reliability, these correlations suggest that good reliability in the CDA assessment is feasible.

Data from two interviews taken at a one year interval described several important differences between the two groups. Credentialed subjects tended to be a later point in their personal and career development, and seemed to have integrated their child care work more completely with family responsibilities and education. Credentialed subjects more frequently had expressed early preference for public school teaching, in contrast with noncredentialed subjects preferences for a wide range of occupations. Credentialed subjects expressed more positive attitudes toward work situations similar to the requirements of the CDA assessment. The help they reported in learning about and preparing for the assessment also indicated that some persons may have more ready access to the assessment than others.

The absence of significant differences on some interview items also contributed important findings. Both groups of subjects tended to view positively their work and its relationship to family responsibilities. There were no significant differences between groups in patterns of work experience or in current career preferences. Subjects in both groups had moved into child care work from a variety of sex typed semi-skilled and skilled positions, and from public school teaching. Although child care was the career preference of many subjects, many also expressed preference for other professions. Few subjects in either group experienced pay increases over the period of the research, and neither group was significantly more likely to receive a raise or promotion. Wage increments in child care, for this sample at least, seemed to be related to education level but not CDA credential attainment.

The content analysis identified two sources describing possible career opportunities for persons who exhibit the CDA competencies. Occupations involving care of very young handicapped children may be an occupation to which the CDA competencies easily transfer. However, additional training in specialized technical content would also be required. The success of future content analyses will depend on the development of competence analyses for more related occupations. There is some literature to suggest that such analyses will become available for child health practitioners, for example.

The case studies of California and Minnesota provided a contrast between the two states' regulations relating to the CDA credential. The contrast suggests reasons for the ready recognition of an innovation like the CDA in some states but not in others. Recognition depends on state officials' and child care professionals' perceived need for the credential, jurisdiction of relevant state agencies, amount of agreement among child care professionals and providers on standards and career development issues, and resources in the state to support existing licensing and credentialing options.

Taken as a whole, the findings from data on child care workers, a content analysis of literature, and case studies of two states suggest the CDA assessment is feasible as a measurement to identify qualified child care staff. Its utility in providing concrete career benefits was not demonstrated by this study, although the data described many symbolic or intrinsic benefits from credentialing. The failure of the credential to enhance career development may be due to a lack of recognition by child

care employers, resistance to adoption of the credential for regulatory purposes, or the limited funds available to enhance child care salaries. Thus while the CDA assessment/credential system may work as a measure of performance in child care, questions remain about its value in improving career development of child care staff or in raising the quality of child care programs.

STATEMENT OF THE PROBLEM

The Child Development Associate credential (CDA[1]) was a response to the expected growth in demand for qualified child care center staff. It was also an attempt to resolve some long standing issues in the child care field about professionalism and career development (Zigler, 1971).

The CDA credential was the principal concern and reason for the research project reported here. The purposes of the research project paralleled those given for development of the CDA credential. One was to explore the validity of innovative approaches to defining and measuring quality; as a nationally recognized competency based credential, the CDA exemplifies such innovations. The other purpose was to evaluate the potential impact of credentialing on career development; as a new professional role within a sex typed and typically low paying occupation, the CDA is an important subject for study.

One cannot consider the validity of an innovative method like the CDA without extending the search to two related areas. The existing literature on validation methodology has little to say about innovations, but a comprehensive review which includes legal and practical implications of measurement (Huff et al., 1980) described both the problems and values in competency based credentialing. In addition, the CDA's impact on child care program quality must be considered with reference to literature on child care and family policy.

The issue of sex typing in occupations was more than a methodological problem skewing the sample for the study. From the growing concern for educational and occupational equity for women, the researchers turned again

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1. Child Development Associate is a registered trademark of the Child Development Associate Consortium, Incorporated.

to literature on family policy. At the same time, the predominance of women in child care pointed to the importance of literature on women's work and family roles. From the beginning of the research project, "dual career" has referred to the fact that most women combine family and work career responsibilities. The overlap and interaction of the two careers seemed a very relevant concern in studying career development in child care.

From the broad perspectives implied by the many issues and concerns mentioned in this introduction, a research project was designed to seek answers to two very practical questions:

1. Does the CDA identify persons who contribute to the quality of child care through their performance as child care staff?
2. Does the CDA enhance the career development of persons who earn it?

These two questions were addressed repeatedly, in many ways, in this very exploratory study. At the same time, their relation to less practical, more theoretical questions in child care, and to related practical questions in other occupations, were frequently considered.

REVIEW OF THE LITERATURE

This literature review is written to demonstrate the need for the research, as well as to describe the theoretical and practical bases of the research design. At the time the research proposal was submitted, the absence of empirical findings on validity of the CDA credential seemed a compelling reason for research. Since that time, criticisms of the CDA, and less specific policy literature, have pointed as well to the importance of non-empirical considerations. This review is organized into three sections corresponding to general theoretical and policy concerns: alternate approaches to increase the availability and quality of child care, the career development of women in the occupation of child care, and the problem of defining and measuring competence.

Meeting the Demand for Quality Child Care

Zigler's initial proposal for the CDA (Zigler, 1971) cited the apparent rising demand for child care as a clear justification for creating a new professional role, the CDA. The view that improved staff qualifications would increase the availability and quality of child care is not uniformly accepted by all child care professionals. The relative importance of staff performance in enhancing overall quality of child care must be critically evaluated:

1. What is the value of staff performance standards, relative to regulating and modifying other elements of child care center programs, in enhancing program quality?
2. How is minimally adequate staff performance to be defined and assessed?
3. How do existing definitions of "professional," and standards based on education and experience, relate to standards of staff performance?

Each of these questions represents a policy issue. Although each has been considered in critical and theoretical literature, there are still few relevant empirical findings.

The Administration for Children, Youth and Families (ACYF) has been criticized for emphasizing staff qualifications and development over other policies to meet families' child care needs. Steiner (1976) questioned the argument that radically increased demand for child care can or should be met by recruiting or training more staff for child care centers. According to Steiner, this argument is based on faulty assumptions that more and more families will place their children in center based care, and that policies encouraging out of home child care are the best way to meet the social and economic needs of families in the United States.

A cross national analysis of family policy also suggests that a narrow emphasis on staff qualifications may be unwarranted. The findings of Kamerman and Kahn (1978) described child care center programs as one alternative for supporting families in their economic and child-rearing functions. The attention commanded by staff qualifications may be relative to the overall importance of center based child care within a given country. In the United States, such care seems to receive much public attention and government support.

A comprehensive review of literature on child care center quality was commissioned in response to the debate over the Federal Interagency Day Care Requirements (FIDCR) (CSPD, 1977). Meyer's (1977) paper on staff qualifications was one of eleven in the review concerning the impact of day care on children, families, and caregivers. The structure and content of the FIDCR review papers suggest that staff qualifications may be one

important policy variable in enhancing program quality, although there is little evidence to suggest they should be the sole or primary policy emphasis.

The absence of knowledge and consensus over what constitutes good child care is most evident in attempts to define staff qualifications. Meyer (1977) based his definition of quality on child/adult ratio and educational level of staff, although he noted that extensive training may not be essential for all staff. State regulations on day care personnel are striking evidence of the difficulty in defining minimal qualifications, let alone relating them to a definition of quality. Some states' regulations are not related to any performance criteria at all; they are based on minimum age requirements and the absence of negative characteristics such as tuberculosis or conviction for a child abuse offense. However, many states also include performance and personality traits which defy objective definition and assessment: "provides humane care", "able to stimulate normal development", et cetera (McCormick, 1977).

Even within center based programs, staff credentialing can be viewed only as one input to quality. The CDA does seem to provide an important, functional alternative to very minimal staff qualification standards and to those based on general and possibly irrelevant standards of professionalism, including general education and experience. Rather than creating a new professional category, the CDA assessment/credential system may serve to describe what is good about the practices of those already employed in child care. It may link the concept of professional to a behavioral definition of performance.

In addition to evaluating the CDA relative to alternative policies for enhancing child care, the credential's career development potential may be considered as a contribution to quality. As Anderson (1980) has argued, the low status and pay of caregivers lead to high staff turnover and the loss of qualified staff. Continuity in care is especially important for young children. In addition to the potential personnel values discussed in the following section, the implications of career development in assuring quality care should be kept in mind.

Women's Career Development in the Occupation of Child Care

Child care is obviously linked to women's career development, as a work related necessity for many women and as an employer for some of them. In a recent national survey, one third of the respondents cited the availability of child care as a problem in their careers (Karman, 1973). Child care has additional significance for women's career development, because it is almost universally a woman's occupation in and away from home. Sheila Kamerman noted that sex typing of child care work is the norm even in Sweden, in spite of aggressive recruitment of men for child care work (personal communication, 1979).

The association of women with child care work is easily documented from statistics on employment patterns and from social stereotypes. Lecht (1977) reported that 93.2 percent of child care workers in 1970 were women, and projected that by 1985 women would still represent 88.4 percent of those employed. Child care is perceived as feminine through its association with the role of teacher (Karman, 1973) or by the extension of the "nurturant" stereotype from mother to caregiver (Safilios-Rothschild, 1979).

The question of status and rewards in child care is crucial, given women's restricted job opportunities women are more likely than men to choose child care for extrinsic reasons such as pay and security (Robinson, 1979, and Wright, 1977), but child care has an ambiguous professional status. Because jobs like child care are rarely occupied by men, they need not compete with men's occupations for status; women's work may earn equivalent status in a separate but equal hierarchy (England, 1979). According to Roberts' (1976) historical analysis, the employment of women in the British Infant Schools in the nineteenth century was an important professional opportunity. Their employment saved money for the schools and accommodated feminists' demands for educational and economic opportunity, but did not violate traditional concepts of femininity. Child care may also be viewed as a profession because of its similarity to teaching and to human service occupations.

Others have argued that professional status is meaningless given the low pay and high demands of the work. For example, Katz (1977) noted a decline in the use of the term "teacher" in child care centers, perhaps in recognition of the more diversified nurturant and custodial activities of most child care workers. She, along with others (e.g., Gaines, 1979; and Mattingly, 1977) have noted the low pay, high stress, and isolation experienced by many child care workers. In Lecht's job market statistics (1977), child care was rated one of the ten lowest paying occupations for women in 1970.

Would professionalization of child care enhance women's career development? This question is problematic, for women's work tends to be underpaid

(by as much as forty percent) relative to men's work for equivalent levels of education and status (England, 1979). Pay differentials even within child care tend to be unrelated to performance. In the National Day Care Study data, pay differentials were significantly related to formal education and staff role (e.g., teacher versus aide). There was no significant differential associated with amount of specialized child care training, a more direct index of professional status and a significant predictor of performance (Ruopp et al., 1979). Professionalization through increased educational requirements has been advocated since women first entered the field (Roberts, 1976). However, the outcomes of this remedy are very uncertain, and the current rewards in child care do not seem to justify it.

Even if men and women were equally represented in child care employment, one could not assume that their pattern of choosing, preparing for, entering, and exiting child care jobs would be similar. Career patterns are multidimensional, reflecting institutional demands, educational resources, social norms, and individual differences (Otto et al., 1979). Especially for women, career patterns tend to reflect continuous attempts to coordinate family and work responsibilities (Grossman, 1975; and Klein, 1975). Although the press of traditional stereotypes may be lessened, changing family responsibilities and differential job opportunities continue to influence women's career patterns (Giele, 1978).

The dual career (family plus work) nature of most women's lives, and sex inequalities in educational and employment opportunities, continue. Therefore, the model of Blau et al. (1956) still seems highly relevant. This model has a time dimension to describe the interaction of career with personality and opportunity variables at various points in the woman's

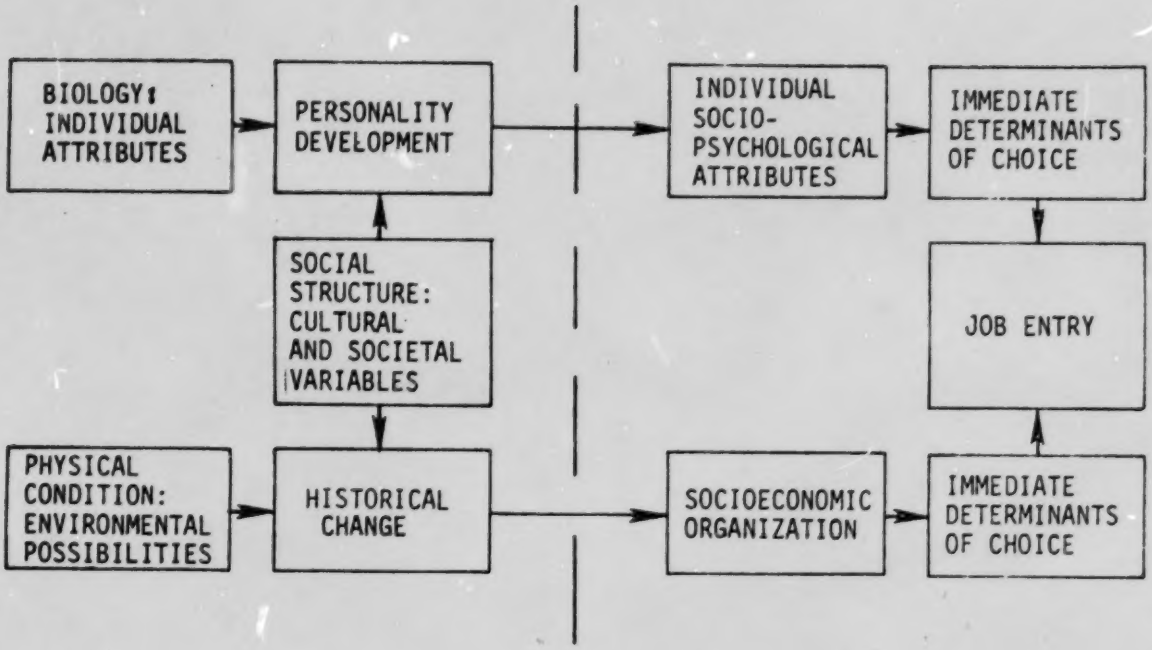

Figure 1. Schema of Blau's occupational choice model (from Blau et al., 1956).

development. Opportunity variables would include environmental influences such as educational resources, attitudes of significant others, incomes, ethnicity, et cetera. Personality variables represent both inherent characteristics of the individual and the delayed effect of environment through cumulative knowledge, attitudes, and experience (Figure 1). The developmental dimension is also included in a model proposed by Fogarty et al. (1971). In addition, recent theoretical analyses have supported the utility of the Blau model for studying women's career development (Feathermen and Hauser, 1976; Tittle and Denker, 1977; Psthas, 1968; Vetter, 1973; and Ginzberg, 1972).

This review of literature on women's career development and work in child care has many implications for evaluating the CDA credential. Attainment of a CDA credential may enhance the professional status of caregivers.

This is an important benefit for workers who have developed competence over a discontinuous career pattern. At the same time, increased status may have little meaning in a field where limited resources do not allow pay increments for professional improvement or even good prospects for job security and promotion. The CDA may be too small an innovation to result in meaningful career change for caregivers. By functioning as only symbolic reward for competence, it may obscure the underlying problems of sex stereotyping and limited resources which seem the basis for the ambiguous status of child care.

This study was designed to investigate career development potential for many reasons. Zigler's original proposal (1971) cited career development as one reason for the CDA. The CDA as a policy innovation created a natural experiment in which related issues about women's employment could be explored. The complexity of women's career development required that many variables be included in the study in addition to those directly related to career preparation and development in child care. These variables are described in more detail in the section on research design.

The Definition and Measurement of Competence

The recurrent question throughout the research was the extent to which the assessment/credential system functioned in the way it was intended to function; this question is "validity" interpreted in the broadest terms. Practical implications are more important to the validity of a credential system than they are in the validation of a research instrument because of the credential's direct impact on persons' employment. That is why the

questions of program quality and career development were given special consideration; as intended outcomes of the assessment/credential system, they are indicators of its validity.

As important as such practical issues are, they would be meaningless without some evidence that the assessment is valid as an instrument to measure competence. The accepted approaches to instrument validation, including content, criterion, and construct, should be applied to the CDA assessment to estimate its accuracy and consistency.

A review of relevant literature on validity must begin with theoretical perspectives on competence. In the research reported here, validity was inferred from the confirmation of relations between variables as predicted by theory. Because of the unusual methodology of the CDA assessment, theoretical arguments are also offered to justify some unique validation approaches attempted in the research. Another reason for discussing theory is to clarify and specify the concept of competence being used in this research.

McClelland (1973) first proposed the concept of competence as a useful way to predict performance in the real world. His proposal redirected psychometricians' attention from theoretical constructs to empirical ones of operant and respondent behaviors related to the individual's functioning in the environment. McClelland's paper established the crucial relationship between constructs of competence or performance and empirical tests of validity. However, in his emphasis on criteria and prediction, "competence" did not imply a microanalysis of behavior. The emphasis was on constructs as traits by which the individual would generalize competent behavior from one situation to another. McClelland's work led to much innovation and

experimentation in the field of employee selection and placement. These developments, and analogous ones in competence based higher education and performance based teacher education are summarized in the work of Harlan et al. (1980) and Huff et al. (1980).

Although not well grounded in theory, the concept of competence also proved useful in improving test fairness and eliminating discriminatory hiring practices. Legislative and judicial rulings created the need for selection practices with demonstrable relationship to job requirements. The possibility of empirically verifiable competence definitions supported these rulings and the policy changes resulting from them (White and Francis, 1976 and Huff, 1974).

In spite of its apparent usefulness and its heuristic value, competency based measurement presents many methodological problems. Traits or generic competencies such as communication ability and problem solving are difficult to define and measure. Job analyses may provide discrete, measurable indices which bear no relation to success (Cangelosi, 1975). A competence definition based on the observed results of performance may introduce spurious effects related to environmental factors rather than to actual performance (McNeil and Popham, 1973).

In addition to sampling and definition, problems arise from the difficulty of defining the domain for performance. The criterion of success on which competence depends includes implicit value judgments and cultural expectations (Baumrind, 1976). The level of success attainable within a given economy is dependent on the supply of skilled workers (Cangelosi, 1975). Finally, there remains the problem of finding performance elements crucial to success in one occupation which are also applicable to others in the same career.

McClelland's discussions of competence were antedated by another theorist's use of the term for a motivational and developmental construct. White's (1959) discussion of competence motivation attempted to account for motivation in the absence of drive or deprivation states. According to this argument, the organism is motivated toward interacting with the environment out of prior experiences of efficacy or successful functioning in the environment. Competence motivation therefore describes a positive feedback loop for development, in which success experiences encourage further attempts at success.

Bandura (1977) has recently focused and refined White's theory to account for adults' coping. This analysis emphasizes cognition as the mediator in competence motivation, the individual's "...expectations of personal mastery (which) affect both initiation and persistence of coping behavior," (p. 193). Bandura describes several ways in which such expectations are derived from experience. Expectations are dependent both on objective criteria of success and the individual's subjective perception of self efficacy.

All of the theoretical and practical developments described here bear on the CDA assessment/credential system as a measurement process. Because it selects persons on the basis of demonstrated ability rather than accumulated experience and education, the CDA should be economical and fair. It should also be more efficient in selecting those who will perform successfully as caregivers. The structure of the CDA assessment may make it both a measure of and a contribution of competence. The experience of participating on a team assessing one's own competence could be an efficacy

experience giving both objective and subjective feedback of success. The enhancement of status through attainment of the credential could also be an efficacy experience.

In addition to the theoretical bases already described, the CDA assessment/credential system seems based on several specific assumptions about measurement and child care. Biber (1973) argued that the definition and measurement of competence must be flexible to allow for variations in child care program philosophy and in the needs and cultural background of families served. In spite of this flexibility, her emphasis on developmental approaches and on process over goals, suggests that the CDA competence definition would be less applicable to performance under behaviorist models of preschool education. Howard (1974) described some of the unique features of the assessment:

1. The assessment samples from the inventory of personal attributes, not task specific behaviors in the caregiver's performance.
2. The assessment takes place in an expanded time frame, paced by the Candidate and the assessment team.
3. The assessment context is the actual child care center; there is little structuring or limiting of this environment.
4. The assessment is a cumulative process using more than one source of information.
5. The inclusion of the Candidate in the assessment team implies a fundamental equality between assessor and assessed.

Howard noted the difficulty of defining competence criteria which would apply in all child care settings while allowing for meaningful and consistent evaluations.

The task of defining and measuring competence for the CDA credential began with the promotion of a new professional role by the Administration for Children, Youth and Families (Zigler, 1971). This new professional role was intended to fill a need in child care staffing patterns, and to recognize the ability of persons already working in child care centers. The CDA was defined as a middle level professional who can take responsibility for the day-to-day planning and supervision of a group of three-to five-year old children in a child care center (NAEYC, 1973). The Child Development Associate Consortium (CDAC) was funded by ACYF to define the CDA competencies and develop the assessment procedures. CDAC is a private nonprofit corporation which represents approximately 20 professional organizations relating to child care. The six competencies were developed by a task force of experts in child development, with input from a survey of 1,300 child care professionals. (The definition of competencies developed by the CDAC is represented in Figure 2.) Upon completion of the competency definitions in 1972, eighteen separate subcontractors developed preliminary assessment procedures.

During 1973 and 1974, the prototype assessment system was field tested in assessments of 188 individuals. Findings of the field test were used to evaluate the feasibility of the assessment system, and rigorous statistical analysis related to validity were not used. However, some indications of validity were reported:

1. Candidates with more years of experience were more likely to be assessed as competent.
2. Candidates who were assessed as competent tended to have more formal education. (CDAC, 1976, p. 26)

THE CHILD DEVELOPMENT ASSOCIATE CONSORTIUM

COMPETENCY STRUCTURE

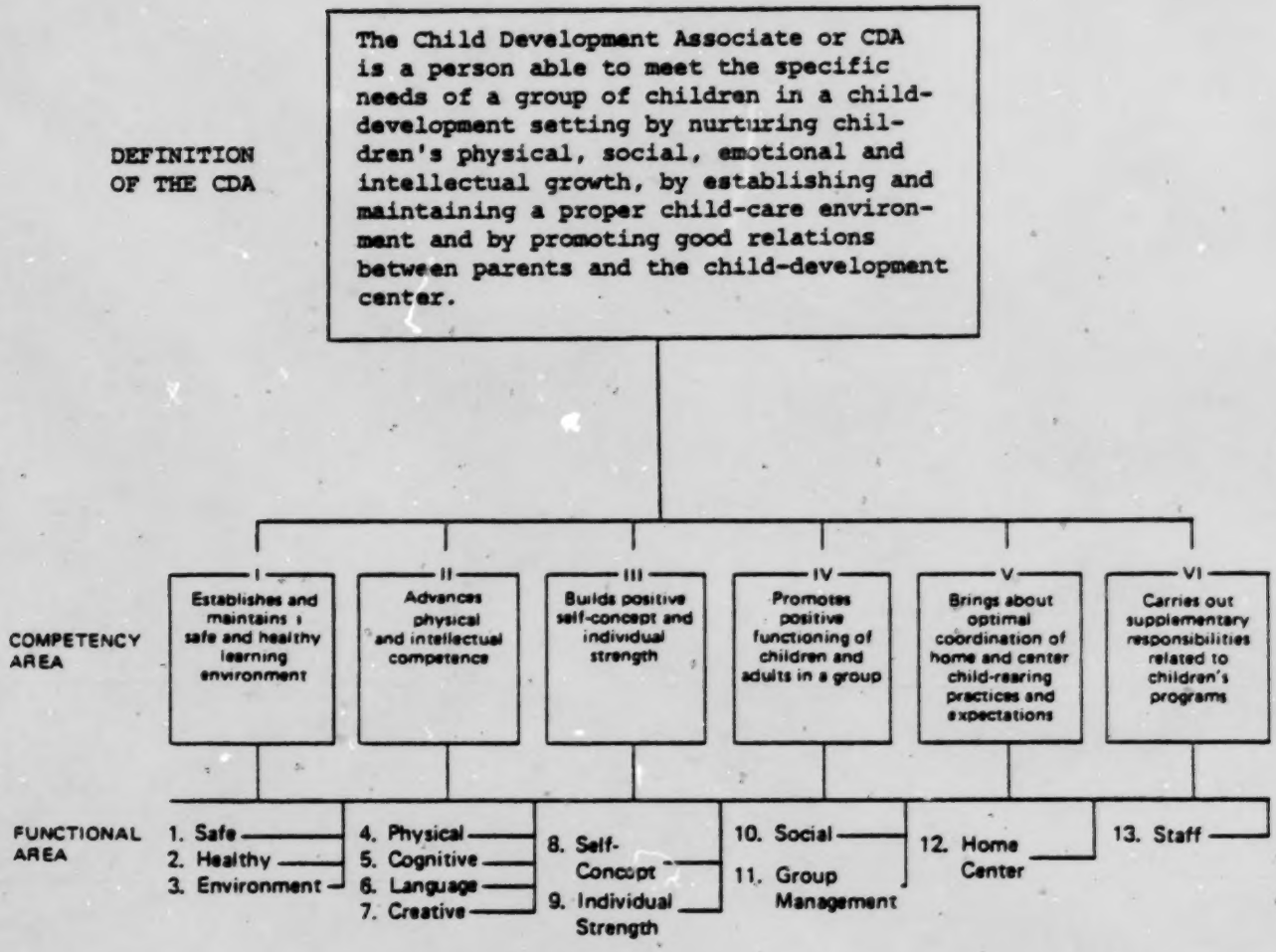
DEFINITION OF THE CDA
The Child Development Associate or CDA is a person able to meet the specific needs of a group of children in a child-development setting by nurturing children's physical, social, emotional and intellectual growth, by establishing and maintaining a proper child-care environment and by promoting good relations between parents and the child-development center.
COMPETENCY AREA
I Establishes and maintains a safe and healthy learning environment
II Advances physical and intellectual competence
III Builds positive self-concept and individual strength
IV Promotes positive functioning of children and adults in a group
V Brings about optimal coordination of home and center child-rearing practices and expectations
VI Carries out supplementary responsibilities related to children's programs
FUNCTIONAL AREA
1. Safe
2. Healthy
3. Environment
4. Physical
5. Cognitive
6. Language
7. Creative
8. Self-Concept
9. Individual Strength
10. Social
11. Group Management
12. Home Center
13. Staff

Figure 2. Schema of the CDA Competency Definition (CDAC, 1976, page 48)

The findings of the initial field test led to modifications in procedure, and an additional field test was conducted in 1975. Results of assessments of 91 candidates from pilot CDA training projects were used to evaluate the feasibility and construct validity of the assessment:

1. Individuals who participated in assessments reported consistently high levels of certainty in their judgments of competence.
2. Perceived certainty in global judgments of competence was highly correlated with certainty of judgments of competence in each of the 13 functional areas.
3. A factor analysis of judges' ratings of certainty of judgment on the 13 functional areas yielded four factors which accounted for 100 percent of the variance. (CDAC, 1976, p. 40)

The development process of the CDA assessment, which encouraged contributions by numerous child development professionals and experts should contribute to high content validity. In addition, the participation of subcontractors in a variety of contexts should increase the validity of the assessment for different applications. However, very little data on validity have been reported. Although the field test findings indicate that judges felt confident in using the assessment procedure, they do not provide evidence on content or criterion validity.

The form tested in the 1975 field tests was adopted by the CDAC in 1975 as the official assessment procedure. Data evaluating the first year of application have been reported (CDAC, 1976). As in the field tests, evaluation tended to focus on feasibility and procedural details rather than validity and reliability. Construct validity was tested by two factor analyses of ratings by 204 judges on 51 candidates. Ratings were

made by the judges before and after discussing their judgments with other observers of the same candidate. The first factor analysis yielded three factors, with one factor accounting for 84 percent of the variance. The second factor analysis yielded two factors, with one accounting for 90 percent of the variance. The factor structures for the two analyses were not congruent and did not replicate those from the field test analyses.

The same before and after ratings of the 204 judges were analyzed for reliability. Of the 51 candidates, judges for 28 achieved good or excellent reliability, based on single classification analysis of variance reliability estimate. The judges of the remaining 23 candidates achieved fair or poor reliability.

Empirical data on content validity have been reported by Ruopp et al. (1979). An observational checklist of teacher behaviors based on the 13 CDA functional areas was used in the National Day Care Study. Teacher behavior as measured by the checklist was significantly related to desirable child outcomes and indices of program quality. This finding suggests that the functional areas validly represent the content necessary to define quality. However, the translation of the CDA competence definition into a checklist provided no evidence of the validity of the CDA assessment procedure.

The assessment procedure finally adopted by the CDA Consortium has been described in several of their documents (e.g., CDAC, 1978). The steps of the procedure are best summarized in terms of the roles of the person being assessed (the Candidate) and the other assessors (members of an assessment team):

"1. The Candidate meets eligibility requirements (based on minimal age and work experience requirements) and completes

application forms. The Candidate selects two other assessment team members: an Advisor and a Parent-Community Representative. The Candidate is also designated as a team member.

2. The three assessment team members begin to collect material for use in the assessment. The Candidate organizes a portfolio of materials to document work in a center-based child care program. The Advisor observes the Candidate at work, consults and writes a summary of knowledge about the Candidate's child care work. The Parent-Community Representative observes the Candidate and collects questionnaires from the parents of all children in the Candidate's group. Information from the observations and questionnaires are summarized.

3. When the Candidate indicates readiness, the CDA Consortium appoints a fourth assessment team member (called the Consortium Representative) and schedules the date for the assessment.

4. On the date of the assessment, the Consortium Representative observes the Candidate at work and conducts the assessment team meeting. The four assessment team members share pertinent information as each competency and functional area is reviewed. Although team members may disagree on particular criteria, there must be consensus (a unanimous vote) on the final judgment about overall competence. By sharing information, team members assist each other in the judgment process. Sharing and consensus are seen as ways to increase information about the Candidate, rather than as sources of bias.

5. The Consortium awards the credential to Candidates who have been voted competent and who have followed the required assessment procedures." (from Pettygrove, 1980, p. 6-7)

The assessment procedure and the competence definition on which it is based have been in use since 1975. The CDA Consortium has awarded credentials to over 6,200 child care staff since that time.

A review of literature on the definition and measurement of competence has several implications for research on the CDA assessment/credential system. First, validity in its most technical sense, as the accuracy and consistency of a measure, is crucial for any competency based measure, but rigorous tests of validity may be difficult to apply. Accurate measurement in terms of competence must refer to some criterion of performance in a specified environment. At the same time, competence is more than a set of predictors. It is a construct which allows for the generalization of competent behavior to new situations. The construct may also include a motivational/developmental component.

Although all competency based assessments present methodological challenges, some unique features of the CDA system make it particularly resistant to existing validation methods. These features have been described by a set of contrasts between the CDA assessment/credential system and more typical measures:

"The open and consensual approach to the assessment team meeting is designed to increase information sharing and clarity in judgment.	It violates the assumption of independence between measures needed for many statistical tests, and may lead to bias between the four team members."
"The competencies and functional areas are intentionally nonspecific to increase their relevance in assessing Candidates in different cultural, administrative and philosophical settings.	The lack of specific standards allows subjective judgment and makes it difficult to define absolute criteria."

"The assessment team members are chosen to represent four different points of view about the Candidate's competence.	Consistency in a rating procedure is often demonstrated by the degree to which different judges rate an individual in similar ways."
"The Candidate is a member of the assessment team, and helps choose two other members, because s/he is a good source of knowledge about her performance and work setting.	Self evaluations are subjective and may lead to a 'halo effect'." (from Pettygrove, 1980, p. 83-84)

In addition to making validation more difficult, the conflict expressed by these contrasts may result in inaccurate conclusions about validity.

Summary

The literature described in this review provided a framework for evaluating the CDA credential in terms of the expressed goals of meeting the need for quality child care and improving career development of child care staff. These goals are not unique to the CDA credential, but are expressed in the design of many competency based measures as more efficient prediction of performance and more fairness in employee selection and promotion.

In addition, literature on the definition and measurement of competence was reviewed to provide a rationale for the design of the study and a view of difficulties in validating innovative measurement procedures.

RESEARCH PROCEDURES

This section describes the way in which the data for the study were collected and analyzed. It is organized into five sections: research design, field study instruments, research staff, field study sample, and analysis of data.

Design for the Study

The research design as originally proposed placed major emphasis on a short term longitudinal study to follow child care staff from credentialing through the next steps of their career. A comparison group was included in order to analyze the assessment's validity and the impact of the credential on career development. This study of women at work in child care will subsequently be referred to as the field study for the research project.

Although originally intended as more supplementary research concerns, two other investigations provided important findings. In fact, the integration of findings from the field study with data from a content analysis of competency lists and with a case study of two states' relevant regulations allowed for more thorough consideration of policy issues.

Field Study of Two Groups of Child Care Staff Although the relatively recent development of the CDA assessment/credential system might be viewed as the initiation of a natural experiment, several factors precluded an experimental or quasi-experimental design. One factor was the possibility of restricted access to the credential; while one might assume that all credentialed persons were competent by the CDA definition, one could not assume that those without the credential were not competent. Many variables besides competence appeared to influence attainment of the credential. Among these were differential opportunities to prepare for the assessment,

and the need or desire to have the CDA credential. Self selection in itself was also a major impediment to a quasi-experimental design. The CDA assessment procedure is dependent on the motivation and timing of the Candidate, from the first application through the observations by each assessment team member to the scheduling of the assessment team meeting. A criterion validity study based on random assignment of noncredentialed persons to the assessment would have eliminated the important assessment features of self selection and self pacing.

Although a quasi-experimental design was not possible, a comparison group was included in the field study. The absence of any descriptive literature on child care as an occupation mandated the collection of data from as many staff as possible. Although causal inferences would not be possible, the descriptive data on both credentialed and noncredentialed groups permitted inferences about the relationship of the CDA to other variables. Further, statistical methods were used to control for some systematic differences between groups.

The geographic area for the field study was the states included in the Department of Health and Human Services administrative regions V and VII: Iowa, Nebraska, Kansas, Missouri, Minnesota, Indiana, Ohio, Illinois, Michigan and Wisconsin. A larger area would have exceeded administrative capabilities for the project and created unduly large expenses in transportation and communication. At the same time, these states represent much diversity in child care program types, ethnic and urban versus rural composition, and CDA training resources. The research staff decided that these geographic limits would not reduce the generalization of findings.

As proposed, field data was collected at two times, with approximately one year interval between the two. Originally it was expected that the second data set would be used only to measure changes on career related variables over the one year interval. In fact, the second year of the field study allowed both for a followup on first year measures and for expanded exploration of some variables. For example, Candidates' attitudes toward testing and the work environment appeared to be important variables on the basis of preliminary first year findings. The second year interview contained two sections which focused on these variables.

The diversity of instruments used in the field study reflected the multiple purposes and exploratory nature of the research. It was important to maximize time spent with each subject by collecting as much useful data as possible; time with subjects was the most costly part of the whole study. At the same time, instruments were selected carefully so that fatigue effects would be minimal.

In summary, the field study used a short term longitudinal design with two groups. Rather than matching subjects in groups, systematic between-group differences were controlled in the statistical analyses. Multiple measures were taken at two times, with a one year interval between measurements.

Content Analysis of Competency Lists A content analysis was included in the design to help describe a career ladder for child care. One portion of the field study data described subjects' work experience or career history. These data were analyzed to form the lower rungs of a career ladder for child care; the content analysis would hypothesize upper levels of the ladder. In other words, the descriptive data described where

subjects had been in their careers prior to their current job, and the content analysis described where persons exhibiting the CDA competencies might look for future employment.

The decision to use a content analysis was based on several assumptions:

1. Competency based analyses of child care related jobs would be available at the time of the study.
2. Subjects' work experiences would be sufficiently regular to be reducible to a meaningful career pattern. In other words, subjects have experienced work in a career, a sequence of work roles within a specified occupational structure (Otto et al., 1979).
3. The CDA competencies and competencies for other occupations would be documented in similar form. This similarity was important for transferability of competence to be inferred, and essential for the matching process used in the content analysis.

As demonstrated in the discussion of research results, none of the assumptions was fully satisfied. However, the partial success of this part of the project should encourage similar attempts in the future.

The content analysis included several steps, which can be summarized as follows:

1. A definition of appropriate source documents for the analysis was specified. Each source had to describe career development opportunity involving work with preschool aged children. The source had to include a list of competencies, skills, or behaviors for one occupation, and some evidence of content validity.
2. Manual and computer assisted literature searches were conducted for appropriate sources. The Educational Resource Information Center and National Technical Information Service were the primary data bases for the analysis.

3. The unit of analysis was specified. For each source, the unit was the individual skill, competency, or behavior. Because of differing methods used in job analyses and competence definitions, it was expected that the total number of units per source would vary greatly.

4. Sources were scanned and a rough frequency count of items was computed. A source was deleted if fewer than ten percent of its units were relevant to the CDA competencies.

5. The content analysis based on frequency of matching items was conducted.

Because of the many approaches to content analysis and its vulnerability to subjective influences, the methods must be carefully specified (Holsti, 1968, and Berelson, 1954). Content analysis is infrequently used and may seem antiquated to some researchers. However, competency based job descriptions seem to lend themselves to this type of analysis.

Case Studies of State Regulations The CDA will have little impact on the quality of child care programs or the career development of child care staff unless employers adopt it as a standard. The greatest incentive for such adoption (aside from intrinsic values and the employer's professional commitment) is state regulations for child care programs.

A case study of state child care regulations allowed intensive investigation of the political dynamics and decision steps leading to either acceptance or rejection of the CDA for regulatory purposes. The case study method was chosen as most sensitive to the unique set of resources, needs, political forces, et cetera, which together might affect the perceived value of the CDA credential. In addition, the case study was

feasible in this study, and a comprehensive review of states' regulations was not.

Two states were chosen on the basis of their potential to produce useful findings and their proximity to the research staff. For contrast, one state had adopted the CDA for child care center licensing, and the other had not. The results section of this report describes other contrasts and similarities. Minnesota was chosen as the first case study subject. When the principal investigator moved to California near the end of the research project, that state became available and was chosen for the second case study.

In both case studies, the strategy was to identify key persons representing the child care field and state agencies concerned with child care program regulation. Those first contacted in each state were asked to name others as key informants. Where possible, information from personal contacts was verified from printed documents on state regulations, history of child care program development, et cetera.

In Minnesota, the strategy resulted in a series of intensive interviews by the principal investigator. The interviews roughly followed an outline of questions prepared to focus on the steps in and reasons for the adoption of the CDA as one of the staff qualification options for child care center licensing. At each interview, informants were asked to confirm and comment on points of information from interviews with other informants.

In California, an initial interview led to the principal investigator's inclusion as a participant observer on a state agency's committee. The Field Based Assessment Committee had been appointed by the Commission on Teacher Preparation and Licensing to consider the CDA credential as one

option for part of the requirements for a child care staff credential called the Children's Center Permit. California has not yet adopted the CDA credential for any regulation and the status of the credential is somewhat controversial.

A list of those contacted for the case studies is provided in Appendix A. In every case, informants were told the purpose and plan of the interviews, and were given a copy of the summary report of the research (Pettygrove, 1980) for comment.

Field Study Instruments

The instruments used in the study are best described according to the research purposes they serve. Career development and practical aspects of the assessment as a measurement system were addressed by two interviews (initial and followup). The Day Care Forces Sort (Rayder et al., 1976) although a separate measure, was included as a part of the followup interview. The supervisor rating was designed as an index of criterion validity as well as for an independent rating for reliability estimation. A written assessment with content corresponding to the CDA competencies served as a measure for concurrent validation. Finally, some of the data collected during the CDA assessment team meetings were used as a set of ratings for estimating reliability. Copies of all instruments have been submitted to NIE.

Interviews An interview schedule on child care as a woman's occupation was not available, but numerous studies have dealt with women's attitudes toward work and family, job satisfaction, and fertility. The Blau et al. (1956) model indicated that both family and work variables might be important, and that both individual characteristics and environmental

variables must be considered. The initial interview schedule drew from many previous studies; some items specifically addressing child care as work were added. After field testing, items were modified or deleted to focus the interview on crucial variables. The interview required approximately 45 minutes to administer.

The second interview was planned simply as a followup, to allow for possible changes in subjects' career status over the one year interval. Preliminary analyses of first year data indicated that practical measurement questions might also be important. Therefore, the second year interview included expanded sections on two aspects of the assessment as measurement. One aspect was the possible effect of measurement process on validity. The second was the problem of access to a new and innovative assessment/-credential system.

The influence of process on validity was suggested by the problems of tests being culturally bound or requiring minimum literacy. Although the CDA assessment is designed to avoid these problems, its innovative procedures may be equally discriminatory against otherwise competent persons. Some CDA candidates (not research subjects) had mentioned feelings of anxiety about the assessment's observational components and reported confusion over the portfolio requirement. The second year interview included questions designed to measure subjects' attitudes towards these novel aspects of the CDA assessment. Assessment features were translated into equivalent aspects of the work environment, so that questions would be equally meaningful for both credentialed and noncredentialed subjects.

The problem of access was also suggested by CDA candidates and other child care workers in Iowa. Briefly, the CDA has been more heavily promoted by Head Start than by other programs. Head Start funds have been earmarked for special CDA related training and orientation efforts (Gilman and Signatur, 1978). Other persons desiring the CDA credential may experience difficulty in learning about the assessment's requirements, preparing for the assessment, and finding persons to serve on the assessment team. Differential access would be a serious problem for a credential designed to increase fairness in child care credentialing. The interview questions on access covered training resources available to the subjects, as well as information about the CDA assessment and support received from the work environment.

In summary, both interviews were designed to investigate personal, familial, and occupational variables which might relate to the development of competence and to upward mobility in a child care career. In addition, the second interview included specific questions on the practical validity problems of interfering measurement processes and differential access to the CDA assessment.

Day Care Forces Sort The importance of the work environment for developing (or eliciting) and maintaining competence was repeatedly raised in discussions with other NIE researchers. Environment emerged as a problem in this project because of an assumption in the CDA assessment that the individual's competence could be assessed apart from the influence of the work environment.

The Day Care Forces Sort (DCFS) (Rayder et al., 1976) was selected for its relevance to the question of work environment and individual competence.

Based on the field theory of Kurt Lewin, the DCFS elicits the subject's perceptions of 26 elements in the child care work environment, from three distinct orientations. One orientation is the positive or negative quality of each element. The second is the control the individual perceived over each element. The third is the perceived strength of each element's influence on the individual's performance. Using a Q sort format, each subject rates all 26 elements on a seven point scale three times (once for each of the three orientations). The order of presenting the three ratings was counterbalanced in this study to prevent order effects. For statistical analyses, the position of each element is recorded as a seven point Likert item response.

The DCFS was developed for use in the National Day Care Study (Ruopp et al., 1979). It has been through several revisions; the Rayder et al. (1976) monograph provides information supporting the validity and reliability of the DCFS. The instrument's ratings are in many ways subjective, so it would not serve as an objective measure of the environment's relationship to competence. However, this subjective approach makes it highly relevant to the theoretical approaches of White (1959) and Bandura (1977). According to those theories, competent persons should perceive more control over their environment than less competent persons. Because competent persons are motivated toward efficacy experiences, perceived control should be directly related to the perceived influence of environmental elements.

Supervisor Rating This instrument was initially conceived as a criterion for validation of the CDA assessment. An observational study of subjects' work performance was beyond the scope of the study, but an independent and current rating of performance was desired.

A rating scale was developed because none was available which could serve as a criterion for all six competencies. In addition, those available (e.g., Beaty, 1975) were very lengthy. Child care supervisory staff tend to be overworked and heavily involved in all kinds of paperwork. A concise measure would receive more complete and thorough attention.

The rating scale finally developed was designed as a criterion (for validation), as an independent replication of assessment team ratings (for interrater reliability), and as a behavioral translation of the CDA competencies (for internal consistency/content validity). The first section of the rating form is an exact copy of the meeting vote form used in the pre- and post-meeting ratings by assessment team members. The second part of the rating form contains 39 behavioral items related to child care work, three for each of the 13 CDA functional areas. The rating form was constructed so that the 13 functional area ratings on the meeting vote form would be completed before the supervisor read and rated the 39 behavioral items. All items are rated on a five point Likert scale to parallel the five point rating of the CDAC meeting vote form.

Written Assessment There are conceptual problems in using a written assessment as a criterion for a competency based measure. However, it appeared to be the best available measure of subjects' actual ability, given that observations were not possible.

The assessment was developed to measure knowledge of concepts related to the CDA competencies (Menne et al., 1975). Child development faculty at Iowa State University developed short answer and multiple choice questions relating to the six CDA competencies. After several revisions, the items

were content validated with ratings by a second group of child development experts. A Kuder-Richardson reliability estimate for the 32 multiple choice items for 121 assessments was .68.

The 83 multiple choice, true/false and short answer items are scored according to a prepared set of guidelines. Although fairly objective, the short answer items allow responses geared to the subject's unique work setting and approach to child care. The emphasis in scoring such items is on problem solving in response to a specified situation, and stating an appropriate rationale for the solution. Thus these items, more than many written test items, seem to reflect actual practice. Eloquent statements, complete sentences, and correct spelling are not required. Interrater reliability for scoring the full test in the present study exceeded .90 for ratings by two raters on ten assessments.

The maximum administration time for the entire assessment is 12 hours. However, the test is organized according to the six competency areas, so that scoring results in six subscores and one overall score. Interviewers were instructed, at their own and the subject's discretion, to schedule several shorter test sessions. The only requirement was that any section attempted was to be completed in the given session. The order for completing the six sections was the same for all subjects.

The written assessment used in this study had limitations in terms of its relevance to competence, its written format, and its length. However, it seemed appropriate to the study because of its direct relevance to the CDA competencies.

CDA Assessment Data The CDA Consortium cooperated in the initial phase of the research project by helping to identify and contact potential subjects. It further cooperated by contributing an important data set, the assessment team ratings for all credentialed subjects.

In the CDA assessment, each team member completes a meeting vote form prior to the meeting. A duplicate of this form is also completed as each team member makes a decision on the Candidate's competence for each of the 13 functional areas. The rating for each functional area is on a five point scale ranging from "Needs more training" to "Excellent". Therefore, the assessment of each candidate results in eight ratings, a pre- and a post-meeting rating by each of the four assessment team members.

The meeting vote data were used to estimate consistency of the assessment. The credentialed subjects' supervisor ratings were used as an additional, independent rating for a computation of interrater reliability.

Summary The instruments used in this study resulted in several overlapping sets of data to investigate both theoretical and practical aspects of validity, and many variables related to career development.

Research Staff

A description of the research staff and their relationship to the research subjects and to specific tasks may clarify the process by which the research was completed. A diagram of staff relationships is included in this section (Figure 3).

The principal investigator first proposed the research problem as a result of her experience administering a CDA training contract for Head Start staff in Iowa. In cooperation with the project director, she successfully completed a research grant proposal to the National Institute

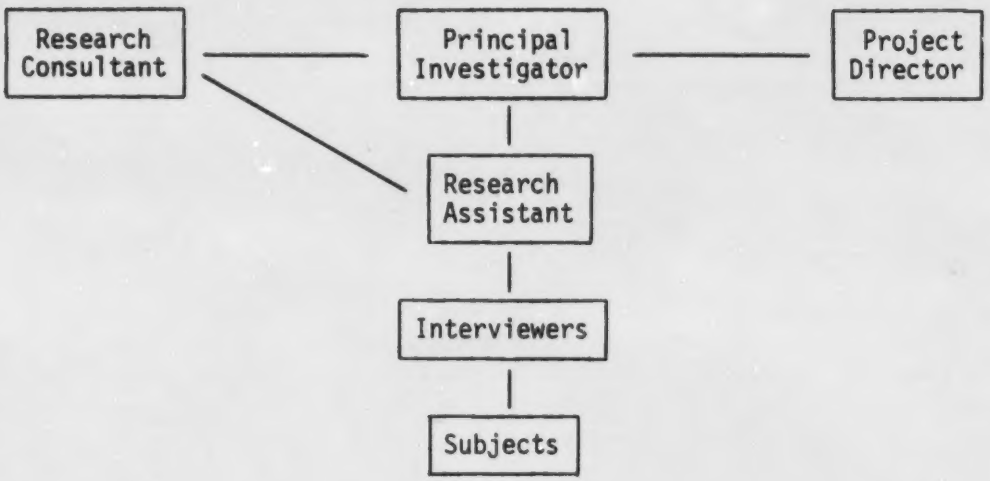

Figure 3. Research Staff Organization

of Education. The proposal also involved support from the Iowa State University Child Development Department and Home Economics Research Institute. The principal investigator managed the field study and had full responsibility for the content analysis and case study phases.

The project director took primary responsibility for the administration of the NIE grant, but she also provided technical assistance on the research design. Her administrative duties were a part of her role as Coordinator of Contractural Programs for the Child Development Training Program at Iowa State University.

Two research assistants served sequentially over the two year period of the research. Each was selected for her knowledge in child development and interest in women's issues, as well as her ability to conduct field research requiring some travel. Both research assistants were graduate students in the ISU Child Development Department at the time they worked on the research project.

Research interviewers were selected for their ability to establish rapport with subjects, knowledge of the field of child development, and familiarity with the CDA assessment/credential process. Child care training institutions in all states in the research area recommended potential interviewers for the project. After an initial telephone contact and review of applications and resumes, at least two interviewers per state were selected. The interviewers are listed in Appendix B.

Prior to each year's data collection, interviewers attended a training session. Sessions were held in Ames, Iowa and Chicago, Illinois the first year; in Des Moines, Iowa and Chicago, Illinois the second. Those who could not attend a session were contacted individually by the principal investigator or research assistant and by other trained interviewers in their area. The training sessions had several major purposes:

1. Review of research procedures: the review covered an overview of the research project as well as specific techniques for interviewing and administering the test. Preparation for actual data collection involved role playing, rehearsal, and simulation exercises using the research instruments.
2. Dissemination of research materials: to save postage and time, some materials were given to interviewers at the session.
3. Instrument development: interviewers had been selected for their knowledge and experience in working with persons like the subjects. Their suggestions were essential in making the interview realistic and practical, as well as in identifying all important items. Especially in the second year, the interviewers' comments on research methods helped fill some important gaps in the research.
4. Assignment of subjects: subjects were assigned by geographic proximity, except where an interviewer had served on the assessment team for a credentialed subject. At

> the second year sessions, some reassignments were made because subjects had moved or because interviewers were added to fill in for the few who could not participate in the second data collection.

Interviewers' qualifications led them to be viewed as peers by both the research staff and the subjects. Their rapport with subjects seemed to contribute to subjects' sustained interest in the research during the second year followup, and thus to low attrition of subjects.

The research consultant had considerable knowledge of appropriate research methods and familiarity with the CDA assessment. She was intensively involved at the beginning of each project year in designing the interview and in organizing data coding. She also took full responsibility for the reliability analysis of the first year data.

The subjects are described in the section on research sample. In addition to their essential contribution as sources of research data, their individual questions and comments were very helpful in the conduct of the research.

Field Study Sample

Sampling for the study was complicated by two factors intrinsic to the CDA assessment. The first was described in the design section of this report; random sampling and assignment to groups was not possible because of the self selecting, self paced nature of the assessment. The second complicating factor was CDAC procedures on confidentiality which protected the identity and other information about potential credentialed subjects.

The first complicating factor could not be eliminated, so that no inferences about causality are possible from the research findings. In lieu of a quasi-experimental design and causal inferences, multiple measures with

appropriate statistical controls were used to compare credentialed and non-credentialed subjects. This approach resulted in a rich descriptive data set on child care as an occupation.

In addition, the self selecting nature of the assessment provided a rationale for employing self selection in the sampling of noncredentialed subjects. Advertisements in child care newsletters in the ten state research area invited child care staff to participate in a research project on the CDA credential. Those responding returned a short form (similar to the CDAC initial application form) with information to be used in screening subjects. Respondents who worked in child care centers, had received no formal CDA training or the CDA credential, and could be reached by an interviewer, were included in the initial pool of noncredentialed subjects. Some respondents dropped out after learning the time requirements of the study. The final group of noncredentialed subjects numbered approximately 100 at the beginning of the field study. The apparently positive interest of this group in research and the CDA would tend to make them more like the credentialed subjects. Thus any observed differences between the groups could be interpreted with more confidence.

The cooperation of the CDAC was essential in identifying and contacting the credentialed subjects. After being assured of necessary protection for the confidentiality of its records, CDAC sent a letter to all women in the ten state research area who had received a credential prior to January 1978. The letter explained the purpose of the research and invited participation. The list of respondents to this letter numbered approximately 120. Some respondents decided they could not participate, and others could not be located; approximately 100 credentialed subjects remained to begin the study.

Each subject received a stipend of $25 for each year's participation in the study. The stipend was intended to repay child care costs and time lost at work due to the lengthy test and interview. The stipend seemed particularly important for workers in a very low paying occupation, especially given the researcher's interest in their career development. The stipends may have helped demonstrate good faith until the research staff had the opportunity to develop rapport with the subjects.

It should be emphasized that the sample attrition for this study was very low. The small loss of subjects is particularly noteworthy given the time length of the study, demands placed on the subjects, geographic dispersion of subjects and interviewers, and high turnover rate in child care employment. Approximately 180 of the original 200 stayed through to the end of the study. Table 1 summarizes the descriptive statistics for the sample.

Analysis of Data

Although discussion of statistical procedures is best integrated with the results of the study, some general comments may clarify the approaches used in the analysis. The overall intent of the research was exploratory and descriptive. For this reason, the statistical and nonempirical analytic methods used are those which provide the most information without reducing confidence in the conclusions.

As originally proposed, the credentialed and noncredentialed groups were to be matched on the basis of age, ethnicity, and education. During the actual sampling process it became apparent that matching was neither practical nor reasonable. It would be too stringent a precaution for many

Table 1. Comparison of credentialed and noncredentialed subjects

Variables		CDA	not CDA	p (X^2 analysis)
Age	18	0	2	<.001
	18-24	4	25	
	24-31	13	25	
	31-45	44	19	
	over 45	29	9	
Family status	married	70	50	.029
	other	20	30	
Children	none	2	4	<.001
	1	14	35	
	2-4	53	36	
	5 or more	21	5	
Program type	Day Care	14	44	<.001
	Head Start	53	7	
	Other	20	29	
Factors interfering with employment	none	47	42	<.01
	job market/ education	6	18	
	family	26	10	
	other	10	9	

		F	p (anova)
Child care courses prior to employment		13.15	<.001
	Means: CDA	18.6 credits	
	not CDA	71.2 credits	
Child care courses since employment		11.97	<.001
	Means: CDA	80.3 credits	
	not CDA	35.5 credits	

comparisons where one or more of the matching variables were irrelevant. It also seemed overly stringent because causal arguments were not intended. Most importantly, matching would have greatly reduced the size of the sample and delayed data collection.

Instead of matching, multiple regression analyses were used where it appeared that a systematic difference between groups would intervene. Multiple regression models or analysis of variance were appropriate for the analysis of most interview items and for the written assessment scores, and for one analysis of the Day Care Forces Sort data.

Simple descriptive statistics, especially cross tabulation and the Chi square statistic, were very useful in selecting from the huge data set the most pertinent and potentially informative comparisons. Of course, some interview questions could only be analyzed by the Chi square.

Multivariate statistics were used to avoid the pitfalls common to studies which rely on multiple tests of potentially interrelated variables. The risk of chance significance findings in multiple t or F tests was avoided by using the Hotellings T square approach to compare the groups on sets of parallel items. On the assumption that responses to such items may represent a smaller number of underlying variables, the Hotelling procedure reduces the many items to one multivariate vector and then tests the difference between groups on this vector. It is the multivariate analogy of the univariate T test (Harris, 1975). The Hotellings T square analysis was used for the positive/negative ratings in the Day Care Forces Sort data. A modified Hotelling procedure was used for a two way contrast between groups on the strong/weak influence and high/low control DCFS ratings.[1]

1. The supporting statistical theory and computer programming for this modification was done by the University of California at Davis Statistical Laboratory under the direction of Dr. Alvin Wiggins.

Another multivariate approach with more exploratory utility was also used. The stepwise discriminant analysis procedure computes a model from several variables which maximally discriminates between groups (Jennrich and Sampson, 1979). Vairables are added to the model sequentially in the order of the amount of between-group variance they contribute. The sequential approach makes it possible to determine which variables, if any, are actually the basis for the observed differences. The stepwise discriminant approach was used on sets of interview items which appeared to be interdependent, often to check findings from univariate multiple regression analyses of single items.

The method of content analysis, although not highly empirical, was selected as a research tool because of its emphasis on meaning in verbal material. Content analysis is the only way to comparatively analyze material which has been written or spoken without reference to a predetermined structure. It seemed very useful in comparing different sets of competency lists, although this represented a rather superficial use of the method.

A content analysis was also proposed to further define the CDA competencies as they are interpreted in the assessment meeting. The CDA competencies are defined in very general terms, but are given very specific and supposedly highly relevant meanings in their interpretation during the assessment. Empirical tests of interrater reliability, emphasizing consistency across ratings and assessments, could not address this feature of the assessment. A content analysis of the interpretations verbalized during the assessment would be very informative. Unfortunately, administrative

difficulties in the CDAC prevented access to the tape recordings of assessments, the raw material for such an analysis. The analysis is still planned, pending support for the lengthy and expensive tape transcriptions needed.

One nonempirical analytic method, the case study, was used in this research project. The method served the exploratory purposes of the research and was helpful in relating findings to policy issues. Clearly, case study findings are difficult to generalize, because there is no assurance that the case in question is representative. The case study findings reported here will serve for contrast, to generate new research questions.

Summary

The purpose of this section of the report was to describe and provide a rationale for the methods chosen for the research. The general rationale was given by describing the design of the study. In addition, relevant theoretical, empirical, and practical considerations in the use of specific methods were described.

Results of the Study

The research on career development potential and validity of the CDA credential involved many directions and methods of inquiry. To simplify this complex set of information, the results will be reported as the findings from the case studies. The results will then be discussed in terms of the various questions raised in the introductory sections of the report. The results are presented more concisely in a summary report, Competence for Children's Sake (Pettygrove, 1980)[1]. The summary report, written for child care professionals and practitioners, is also oriented more toward the possible application of the findings.

Field Study Results

Written Assessment The written assessment based on the CDA competency definition yielded six scores, one for each of the six competency areas. Because the credentialed subjects included more persons with higher education and more white persons, a multiple regression analysis was used to control for both of these variables. An effect for both education and ethnicity was expected because of the effect of differential educational opportunity on written test scores. Education and ethnicity were significantly related to test scores on all six competencies (Table 2).

The analysis of written test scores showed a significant difference favoring the CDA subjects in scores on two competencies. These differences

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1. The report Competence for Children's Sake: A Summary Report of a Research Project on the Child Development Associate Credential may be ordered for $2.00 (to cover printing and mailing costs) from the Child Development Training Program, Iowa State University, Ames, IA 50011.

Table 2

Results of Multiple Regression Analysis for Written Assessment Scores*

Subtest	Source	F	p	Means	Total Score Possible
1. Establish a safe and healthy learning environment	CDA	7.89	.01		
	Education	22.69	<.01		
	Ethnicity	45.37	<.01		
				Not CDA = 44.9	57
				CDA = 46.6	
2. Advance physical and intellectual competence	CDA	1.56	.21		
	Education	28.18	<.01		
	Ethnicity	37.82	<.01		
				Not CDA = 53.6	62
				CDA = 53.5	
3. Build self concept and individual strength	CDA	0.00	.98		
	Education	20.10	<.01		
	Ethnicity	42.20	<.01		
				Not CDA = 39.5	48
				CDA = 38.6	
4. Promote positive functioning of children and adults in a group	CDA	1.62	.19		
	Education	10.56	<.01		
	Ethnicity	26.03	<.01		
				Not CDA = 9.8	13
				CDA = 9.9	
5. Optimal coordination of home and center	CDA	4.37	.04		
	Education	31.28	<.01		
	Ethnicity	35.61	<.01		
				Not CDA = 20.2	23
				CDA = 20.51	
6. Supplementary responsibilities	CDA	1.63	.20		
	Education	13.42	<.01		
	Ethnicity	40.79	<.01		
				Not CDA = 10.31	15
				CDA = 10.5	

*from Pettygrove, 1980, page 28.

were significant even when the influences of education and ethnicity were controlled. The means and range of scores for both groups on the six competency scores suggested that the findings were not related to a ceiling effect, restricted range, or number of total points in the competency scores.

The difference on the first competency, "Establish and maintain a safe and healthy learning environment," was significant at the .01 level of confidence. This finding may have major implications in terms of the CDA credential's relation to quality in many different types of child care programs. Other competencies may receive different emphasis depending on program philosophy, but all programs would need to provide an appropriately stimulating and nurturing environment for the children in their care.

The implications of the finding for the significant score difference (on competency five) are less clear. This competency may receive different emphasis and be manifested differently depending on the type of program employing the caregiver. Head Start, the employer for many of the credentialed subjects, has historically made parent involvement and parent education major program areas. The differences on this competency score between the credentialed and noncredentialed group may be due to some extent to differences in Head Start employment. This competency's importance and relevance in improving quality may depend on child care programs' needs and goals.

The absence of other significant differences relating to credential status suggests that all the findings on the written assessment scores should be viewed with caution. The scores may reflect ability to verbalize appropriately rather than ability to perform competently. Verbalizing

appropriate practice on competencies two, three, four, and six may require a level of conceptual sophistication which is not related to competent performance. However, the limitations in inferring competence from written test scores applies to the scores for all the competencies.

Interview Data In addition to their differences on some descriptive statistics (see Table 1, page 40), the credentialed and noncredentialed groups differed significantly on some attitude items in the first year interview (Table 3, on following page). The differences on these items suggest that credentialed subjects have some different perceptions of the relationship of their work to their own development and to that of their families. Taken with the descriptive data from Table 1, these differences seem to describe the credentialed group as being at a later point in personal and family development. As Head Start employees, many began their career as volunteers in programs for their own children. College training received after employment, especially if designed to relate directly to the CDA competencies, would tend to be perceived as more relevant.

However, of equal importance in the first year interview are the many items on which the two groups did not significantly differ. In spite of the demands and few rewards of child care, subjects tended to express positive attitudes towards their work.

One major first year finding highlighted the need to consider both intrinsic and extrinsic values of work. This was the finding that while education did significantly predict child care wages, credential status did not (Table 4). The employers of all subjects in this study tended to relate pay level to years of education. If value was associated with attainment of a CDA credential, it was not translated into a wage increase.

Table 3

Attitude Items from First Year Interview

Discriminating Items	Mean* CDA	Mean* not CDA	p values (Multiple regression terms) CDA	Education	Age
I consider myself a career woman.	2.34	2.58	.0154	.4241	.0008
College courses have been relevant to my work.	2.24	3.14	.0252	.7101	.4797
My children benefit from my working.	1.48	1.76	.0313	.6630	.0132
My child rearing ideas have changed as a result of my working.	1.17	1.19	.0015	.0745	.0416

Nondiscriminating Items	Mean all subjects
I consider child care a profession.	1.34
If I had my choice, I would not be working in this field.	6.20
My child care in-service training has been meaningful to my job as a child care worker.	2.19
Most of my knowledge and skill is from my education and training.	2.72
My close friends strongly approve of my having a career.	1.73
In general, I feel my children have received good care.	1.45
I feel guilty about working when it comes to my children.	5.44
I feel the quality of family relationships is better because I am working.	2.34
I would rather be home with my own preschool aged children.	3.95
I feel I give more to the children at the center than I do to my own children.	5.65
My children accept my working.	1.68
My experiences in raising my children have been very rewarding.	1.27

*1 = strongly agree, 7 = strongly disagree.

Table 4

Multiple Regression Analysis of Child Care Wage by Credential Status, Education and Ethnicity

Source	F	p
CDA	.89	.348
Education	4.95	.028
CDA Education	1.01	.317
Race	.01	.905

The perceived value of the credential may have had no effect on salary schedules because of its relative novelty. Although some of the subjects may have had their credential as long as two years at the time of the interview, many had recently earned it. The first year interview may have come before pay raises and promotions could occur. A major purpose of the second year interview was to check for improvements in career status and pay of credentialed subjects relative to noncredentialed ones.

The preliminary findings from the interview on differences in age, family status, education, work, and attitudes were explored in more depth in the second year interview. Of particular interest were the following questions:

1. To what extent were the patterns suggested by attitudes, personal development, and family status related to actual career patterns?
2. What aspects of child care led subjects to perceive it as a profession?
3. Did attainment of the credential lead to intrinsic benefits such as changes in the work environment, or at least more self perceptions of efficacy in the work environment?
4. In what ways had subjects experienced ease or difficulty in access to the credential process?
5. Would a wage or other career development benefit from the credential be reported after another year's time had elapsed?

These questions were explored in specially designed sets of items and in the analysis of the Day Care Forces Sort data.

1. To what extent were the patterns suggested by attitudes, personal development, and family status related to actual career patterns? Career pattern differences between credentialed and noncredentialed subjects were partially confirmed by analyses of career histories (Tables 5 and 6). Although there were a few differences in kinds of jobs held, both groups tended to have moved from a variety of stereotyped female semiskilled and skilled jobs, and public school teaching, into child care work. However, volunteering was commonly a career step for credentialed subjects only. The career pattern is summarized in Figure 4, page 71.

More interesting differences appeared in an analysis of changing job preferences or career goals. Subjects were asked to remember major life events or milestones (e.g., high school graduation, marriage, birth of child) and then to tell what career goal they held at the time of each milestone. This sequence of career goals was standardized by approximate age at milestone for comparison purposes.

As can be seen in Table 6, the pattern of career goals shows significant differences between groups at all points except the late twenties and the forties. The noncredentialed subjects' diverse goals at the teenage milestone contrast with credentialed subjects' more frequent preference for public school teaching. At the early adulthood milestone, noncredentialed subjects' preferences appear to shift toward child care work and seeking more education; credentialed, toward homemaking. At the late twenties milestone, additional education became the goal of a higher percentage of subjects in both groups. Preferences at the thirties milestone suggest that many subjects

Table 5

Summary of Career History Data[1]
Number (N) Reporting Each Occupation

Most frequent occupations by group all steps combined

CDA		Noncredentialed	
Occupation*	N	Occupation*	N
13	74	13	67
14	45	14	33
65	24	11	20
11	20	65	13
97	19	70	13
3	17	3	12
66	14	83	12
83	14	66	10
32	11	32	9
78	11	67	9

Most frequent occupations for last four career steps, both groups combined

Step 4		Step 3		Step 2		Step 1	
Occupation*	N	Occupation*	N	Occupation*	N	Occupation*	N
13	84	13	35	97	9	65	7
11	32	14	43	13	18	3	12
14	10	65	6	65	14	83	9
84	2	32	5	14	13	14	10
				82	6	83	4
						32	4

*Occupation codes:
3 = public school teacher
11 = child care director
13 = child care teacher
14 = child care aide
32 = youth worker
65 = secretary
66 = retail sales
67 = cashier
70 = file clerk, social work
78 = factory worker
82 = food service worker
83 = waitress
97 = volunteer

[1]from Pettygrove, 1980, page 61.

Table 6

Career Goals at Each Milestone* (percentages in parentheses)

	Total responding	Public school	Child care center	Recreation, Health	More education	Business, Professions	Nursing	Technician, Sales, Clerical	Secretary	Skilled, semiskilled trades	Homemaker	Other	p value χ^2 analysis
I. Teenager													
CDA	74 (100)	25 (34)	2 (3)	2 (3)	1 (1)	13 (17)	5 (7)	2 (3)	9 (12)	3 (4)	12 (16)	0 (0)	.05
not CDA	70 (100)	14 (20)	5 (7)	7 (10)	7 (10)	10 (14)	5 (7)	5 (7)	3 (4)	6 (8)	7 (10)	1 (1)	
II. Early adulthood													
CDA	57 (100)	8 (14)	3 (5)	0 (0)	4 (7)	5 (9)	1 (2)	2 (3)	4 (7)	5 (9)	25 (44)	0 (0)	.0001
not CDA	60 (100)	11 (18)	21 (35)	2 (3)	6 (10)	9 (15)	2 (3)	0 (0)	0 (0)	3 (5)	6 (10)	0 (0)	
III. Late 20's													
CDA	51 (100)	9 (18)	15 (29)	1 (2)	9 (18)	3 (6)	0 (0)	1 (2)	1 (2)	0 (0)	8 (16)	4 (8)	.67
not CDA	36 (100)	5 (14)	11 (30)	1 (3)	6 (17)	4 (11)	0 (0)	0 (0)	1 (3)	2 (5)	2 (5)	4 (11)	
IV. 30's													
CDA	47 (100)	7 (15)	26 (55)	8 (17)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (6)	3 (6)	.01
not CDA	18 (100)	2 (11)	11 (61)	0 (0)	2 (11)	2 (11)	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	0 (0)	
V. 40's													
CDA	24 (100)	1 (4)	20 (83)	1 (4)	1 (4)	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	.82
not CDA	11 (100)	1 (9)	9 (82)	1 (9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	

*from Pettygrove, 1980, page 54.

were moving towards a preference for child care work. The table for the forties milestone is too sparse for proper interpretation.

The issue of career preference was further explored by asking about subjects' "career dream" with the following question:

> "If you were graduating from high school now and could pursue the necessary training and education, toward what career would you work?"

This question was designed to focus on preference without the influence of limited job or educational opportunities. The two groups of subjects did not differ significantly on their responses to this question. A large percentage (46 percent) named child care. However, other preferences were also named, the highest percentage being for business and the professions (19 percent) and public school jobs (16 percent). The discrepancy between career dream, past career preferences, and job now held confirms Blau's (1956) general notion that career choice is dependent on both personal and opportunity factors.

Although not conclusive, the data indicate some differences between groups in their career experience. On the basis of expressed preference, it appears that the credentialed subjects modified their early goal of public school teaching to the goal of child care work, perhaps in response to family pressures and diminished educational opportunities. Noncredentialed subjects similarly shifted from a diverse set of preferences to child care. Their earlier commitment to child care as a goal may reflect recognition of limited work opportunities.

The career preference data have been grouped by age, but it may be inappropriate to view them as a cross section of one pattern, because of

different age distributions in the groups. Many credentialed subjects would have begun their careers at an earlier time, when work and education options for women were fewer. The older credentialed subjects have been in their careers longer, and thus have had more opportunities for adjusting expectations and trying different options. The limitation in a cross sectional interpretation could not be avoided given the sample size of this study, but future research should attempt to clarify the career patterns of the two groups.

2. What aspects of child care led subjects to perceive it as a profession? The difference between subjects in their perception of child care as a profession was not significant. The mean rating on this first year interview item suggested high agreement with the item (Table 3, page 48). In the second interview, subjects were asked to list aspects of child care which made it a profession. The most frequently mentioned aspects were education and training requirements (43 percent), the emphasis of working with young people (34 percent), the orientation toward service (10 percent), and the responsibility associated with the work (13 percent).

Interestingly, these characteristics all refer to inherent qualities or requirements of the occupation, not external rewards or recognition. Because of their emphasis on the social value of the work, the subjects may see no contradiction between what their profession requires of them and what it earns for them in the way of pay, status, or job security.

3. Did attainment of the credential lead to intrinsic benefits such as changes in the work environment, or at least more self perceptions of efficacy in the work environment? The reasons given for child care's

professional designation reflect the subjects' perceptions of intrinsic, if not extrinsic value from the work. Intrinsic benefits were also the perceived outcome of the CDA credential. The most frequently mentioned benefit was self assessment or appreciation of one's competence (49 percent), followed by education (26 percent), and maintaining their current job (13 percent). Only three percent of the credentialed subjects mentioned increased pay as a benefit of the CDA.

In addition to directly questioning the subjects about benefits, the question was addressed indirectly with the Day Care Forces Sort. The results of that measure are discussed in a separate section of this report.

4. In what ways had subjects experienced ease or difficulty in access to the credential process? The question of access was analyzed as two separate but very related problems. First, access was viewed in terms of a set of practical means to finding out about and preparing for the assessment. Head Start employment was found more frequently among credentialed subjects. Given the emphasis in Head Start on orientation about and preparation for CDA assessment, employment status was a confounding variable. Access was also viewed more abstractly as the potential discriminatory effect of novel assessment features which may be irrelevant to the CDA competence definition. While not requiring unusual reading or writing competence, the CDA assessment's features may be equally difficult for some otherwise competent individuals.

The interview questions about practical limits to access centered on special training resources, informal support within the work environment, and reasons for attempting the CDA assessment (Table 7). Among the

Table 7

Interview Responses on Access to CDA Credentialing*

CDAs only

		%
1. First heard about the CDA?	workshop	33
	other training	4
	coworker	16
	Consortium brochure	7
	college class	9
	other	31
		100
2. Staff in your center working on the CDA at the same time?	alone	31
	one other	14
	2-5	28
	more than 5	27
		100
3. Helpful to know others working on the CDA?	yes	75
	no	25
		100

Noncredentialed only

4. Main reason for not having CDA?	haven't taken time	13
	not interested	65
	not required	9
	other	13
		100

X^2 tests comparing both groups

5. CDA required by the center.

	Director	Teacher	Other	Not required	p
CDA	4	36	6	40	
not CDA	1	4	9	60	<.001

6. CDA required by the state.

	Director	Teacher	Other	Not required	p
CDA	3	7	11	64	
not CDA	1	1	2	69	<.03

7. training helps

	Trainer	Trainer visits	Books & Materials	College Courses	Tuition Paid
CDA	11	9	8	18	2
not CDA	1	10	9	9	0

	Workshops	Other	p
CDA	22	6	
not CDA	21	16	<.02

*from Pettygrove, 1980, page 43.

credentialed subjects, it appeared that few had learned about and prepared for the assessment in isolation. A very small percentage had learned about the CDA from Consortium publicity; most had received information from an organized learning activity or from peers at work. Similarly, most credentialed subjects had not been alone in their workplace in working on the CDA. Knowing one or more others undoubtedly provided a network of support and information for many Candidates; perhaps employers supported staff in working together toward the assessment. Credentialed subjects tended to receive more help which would seem to facilitate attainment of the CDA credential in the form of a designated CDA trainer and college courses. However, the data for question seven on Table 7 suggest that only a small number in both groups received training help.

The important motivating effect of licensing and employer requirements was also supported by the data in Table 7. The main reason given for not attempting the CDA was the lack of interest or a requirement to do so. Significantly more of the credentialed subjects are employed in programs or states where the CDA is required. In the absence of concrete support to prepare for credentialing, or a requirement to do so, staff persons may be unwilling to commit their own resources to earn the credential.

In a more abstract analysis of access, the process features of the assessment were considered. On the basis of a Consortium description of the assessment (CDAC, 1978) and anecdotal data from CDA candidates, the following features were judged as most likely impediments to potential CDA candidates:

1. CDA candidates must take a leadership role in selecting assessment team members, pacing the assessment process,

and determining when the members and their materials are ready for the assessment.

2. Candidates must be willing to be observed and evaluated in the work setting by three other individuals; one observer is a complete stranger who may be perceived as an "outside expert".
3. Candidates must keep records on their work, and evaluate, organize and write them in the portfolio for the assessment.
4. Candidates must work in a cooperative relationship with members of the assessment team while being evaluated by them. (from Pettygrove, 1980, pages 37-38)

Clearly, questions based on the CDA assessment would bias subjects' responses because of their different levels of experience with the process. The interview questions were designed to avoid this problem and the social desirability bias often associated with questions about performance. The four process elements were translated into equivalent work features. The following is one item regarding the third process feature, evaluating and organizing written records of work:

(1 = always true for me)		(7 = always true for me)
Some people keep written records (like a journal) to study their own growth as a caregiver.	and	Other people do not find such records helpful in understanding their growth.

The item format, from Susan Harter's (1979) research on children's competence motivation, reduces the social desirability bias by suggesting that either response is equally possible and appropriate. Nineteen such items were written, each relating to one of the four assessment features.

A stepwise discriminant analysis (Jennrich and Sampson, 1979) was computed on the data for all subjects from the 19 items. This analysis identified those items which significantly discriminate between the two groups (Table 8). The findings summarized in Table 8 suggest that some features of the assessment process may appear to be more tolerable and/or attainable to credentialed than to noncredentialed subjects. Items 2 and 15 related to the cooperative nature of the assessment (feature 4, above). Item 10 relates to the portfolio requirement (feature 3). Item 18 relates to tolerance of observation and evaluation by others. It is noteworthy that all discriminations on these items are in the predicted direction. However, the failure of 13 of the 17 items to discriminate significantly suggests that the differences between groups should not be overemphasized.

The data on practical and abstract aspects of access do not demonstrate a discriminatory impact from the assessment. Further, there is no basis to argue that the presence or absence of support, or features of the assessment process, either encouraged or impeded any subject attempting the assessment. The data do document some aspects of the CDA assessment as perceived by the subjects in the study which may interfere with successful attainment of the credential. Further research is needed if these perceptions are to be verified.

5. Would a wage or other career development benefit from the credential be reported after another year's time had elapsed? The analysis of first year data indicated that variations in pay were not related to credential status. The second year data confirmed this. Credentialed subjects were no more likely than noncredentialed subjects to have received a pay raise or

Table 8

Discriminant Analysis of Test-Related Work Attitudes

Step[1]	Item #	Individual F	
#0 (df 1,144)	2	3.746	
	10	13.123	
	15	7.408	
	18	5.397	
#1 (df 1,143) enters item 10.			Overall F^2 for this step = 13.123
	10	13.123	($p < .01$)
	2	1.926	
	15	5.274	
	18	3.361	
#2 (df 1,142) enters items 10 and 15.			Overall F^2 for this step = 9.393
	10	10.870	($p < .01$)
	15	5.274	
	2	.896	
	18	2.558	

[1]The stepwise discriminant analysis enters items sequentially beginning with the item with the largest individual F value.

[2]This is the approximate F value calculated from the U Statistic or Wilkes λ for the multivariate model.

Item		Mean CDA	Not CDA
2. Some people share their own work and tasks with volunteers. (=1)	Other people give volunteers tasks which would not be done by paid staff. (=7)	2.26	2.73
10. Some people keep written records (like a journal) to study their own growth as a caregiver. (=1)	Other people do not find such records helpful in understanding their growth. (=7)	3.23	4.45
15. Some people are uncomfortable having visitors in the center. (=1)	Other people enjoy visitors. (=7)	6.07	5.50
18. Some people like to have a supervisor who works closely with them. (=1)	Other people prefer to work without direct input from their supervisor. (=7)	3.61	4.39

promotion. In fact, only seven percent of all subjects received any pay raise during the year between the first and second interview.

These findings may point to a problem more fundamental than the economic value of the CDA credential. They suggest a ceiling effect in child care wages. If the range of pay levels is narrow and the upper level fixed from year to year, a meaningful variation related to credential attainment may not be possible.

Day Care Forces Sort The Day Care Forces Sort (DCFS) produced three different ratings by each subject on a set of 26 items. The items were rated on the following dimensions on a seven point scale:

1. The positive/negative quality of each item's influence on the subject's performance,
2. The strength of its influence on the subject's performance,
3. The amount of control the subject felt she had over the item.

All 26 items represent elements of the child care work environment which were found to be important in differentiating among child care center programs (Rayder et al., 1976).

Two analyses were done for the DCFS data. One contrasted credentialed and noncredentialed subjects' perceptions of the positive/negative dimension; would persons with the CDA credential tend to perceive their environment more positively? The second analysis related strength ratings to control ratings and looked for a difference in the relationship between credentialed and noncredentialed subjects. Based on the theoretical work of White (1959) and Bandura (1977), it was predicted that competent (i.e., credentialed) subjects would report more control over those elements which they perceived as strong influences on their performance. The

second analysis, as a test of a theoretical concept of competence, could be viewed as an analysis of construct validity of the CDA credential.

The positive/negative ratings were tested using the Hotelling's square statistic (Harris, 1975); the rationale for this statistic was discussed in the methods section of the report. The differences between the credentialed and noncredentialed subjects' ratings on this dimension were not significant. Credentialed subjects were no more likely to report positive perceptions of their work environment. At least two interpretations are suggested. One is that credentialed subjects were not working in more positive environments than their noncredentialed counterparts. The other is that the development of competence, or at least the attainment of a symbol of competence, did not contribute to more positive attitudes about the work environment. By either interpretation, the data do not suggest a positive outcome of credentialing, even as a symbol.

The relation between strength and control for the two groups of subjects was first tested with a repeated measure split plot analysis of variance procedure. This allowed for a simultaneous analysis of the strength and control dimensions (the repeated measures on the 26 items) along with the effect of credentialed versus noncredentialed group (the "split plot" in this model). To confirm the predicted relation between strength and control dimensions for the credentialed group only, the analysis would have to show significant main effects for both dimension and group, and a significant group by dimension interaction.

The results of the analysis are presented in Table 9. Although the results are interesting and suggest the need for further analyses, they do

Table 9

Analysis of Variance for Day Care Forces Sort[1] Strength and Control Ratings

Source*	F	p
Group	.42	.52
Scale	277.25	<.001
Scale x Group	.38	.54
Item	105.05	<.001
Item x Group	1.3	.14
Scale x Item	79.27	<.001
Scale x Item x Group	.95	.54

[1] from Pettygrove, 1980, page 35.

*Group refers to placement in either CDA or noncredentialed group. Item refers to the 26 child care environment items rated on the DCFS. Scale refers to the DCFS Strength and Control scales.

not confirm the theoretical prediction which was the concern of this study. Particularly important is the absence of a main effect for group. It appears that elements of the environment (item) are perceived very differently, and that there are significant differences in the perception of strength and control dimensions. Further, the perceived strength of an element seems dependent on the subject's perception of control over the item.

Because of the limitations in applying an agricultural statistical model to analyze human behavior, another statistical method was used as well. A modified version of the Hotelling's T square procedure was used to compute the simultaneous contrast of strength/control dimension and credential status. The results of this analysis confirmed those from the analysis of variance. There was a significant effect for strength/control dimension ($p < .01$), but no significant difference between credentialed and noncredentialed subjects.

The results of the analysis of DCFS data suggest that it may be a useful tool for studying different perceptions of the child care work environment. However, the results do not suggest that the CDA credential is related to differences in perception as recorded by the DCFS. To quote an earlier report of this data,

> "It may be that the credential does contribute to heightened self awareness of competence, but that this does not result in changes in the environment. Some CDAs may find themselves in work environments which are subject to some control. Other CDAs, in their responses to the DCFS rating task, may be making a realistic appraisal about their lack of control over their work environments." (from Pettygrove, 1980, page 36)

By adding objective measures of the environment and the individual's performance in it, future research may clarify the relationship between the environment, perceptions of it, and the development of competence.

Supervisor Ratings Preliminary analyses of the supervisor rating data indicated that they were not usable for an analysis of criterion validity. Although very complete, the ratings were all highly positive. Both the 13 functional area items and the 39 behavioral items were highly intercorrelated. It was concluded that in spite of the structure of the rating and the specific behavioral content of the 39 items, the ratings produced a very strong halo effect. The ratings could not be used to compare the two groups.

It is likely that the job supervisors perceived the research staff as outside evaluators, in spite of precautions to assure them that this was not so. Because of the risk of exposing incompetent or undesirable practices in their programs, the supervisors simply gave very positive evaluations in

response to the rating task. The wording of items as competencies may have created a positive response set. The procedure of asking the subject to identify a supervisor for the rating may have introduced some bias; however, many subjects had only one supervisor and could not select a particularly favorable one.

Because of the failure of this rating, the apparent problems in using the job supervisor as a criterion, and the expense of collecting such data, the supervisor rating was not attempted in the second year of the study.

Consortium Data The CDA Consortium provided copies of the assessment team rating forms for all credentialed subjects. Data from these ratings became the basis for an analysis of interrater reliability.

The data set included pre- and post-meeting ratings by each of the four assessment team members: the Consortium Representative, the Candidate's Advisor, the Parent-Community Representative, and the Candidate (the subject in this study). In addition to these eight ratings, the job supervisor provided a ninth rating. All ratings were the 13 functional areas, each rated on a five point scale.

The following limitations in this data should be noted:

1. The pre-meeting ratings and supervisor ratings were based on observations taken at different times by persons selected to represent different points of view.
2. The post-meeting ratings were not independent in that they were recorded after the team members had shared observation data and evaluations.
3. One set of pre- and post-meeting ratings were self ratings, by the Candidate herself.

4. The supervisor ratings appeared to exhibit a halo effect.
5. All ratings were for credentialed subjects, so the range of scores should be restricted.

These limitations tend toward both extremes, some tending to increase interrater variance and some to introduce bias and nonindependence.

The reliability estimate used was the Spearman Brown average interrater correlation. The results of this analysis, presented in Table 10, suggest

Table 10

Average Interrater Correlations for Four LAT Members and Job Supervisor*

Functional Area	r	Average Offdiagonal r
1	.70	.21
2	.72	.22
3	.72	.22
4	.68	.19
5	.82	.33
6	.74	.24
7	.74	.24
8	.74	.24
9	.73	.23
10	.76	.26
11	.75	.25
12	.72	.22
13	.73	.23
Overall competency	.73	.25

*from Pettygrove, 1980, page 31.

that the ratings are significantly intercorrelated ($p = .01$) (although they do not attain the level usually expected for good reliability (approximately .85). Further the low and nonsignificant offdiagonal correlations indicate

that the functional areas are serving separate and meaningful rating criteria.

Inferences from these findings are limited by the combined problems of divergence and nonindependence in the ratings. However, the inter-rater correlations are all significant. This fact suggests that a reliable rating may be possible in spite of the CDA assessment's many deviations from accepted measurement practice.

Content Analysis

The manual and computer assisted literature searches yielded only two sources which fully met the requirements for this study. A third source described a potential career development opportunity (Silver and Ott, 1973), but a competency list was not available for analysis.

The initial pool of sources included 250 documents relating to careers and jobs in health, education and human services. Of the 250, only ten contained sufficient specificity for use in a content analysis. Some of the ten job analyses or competency definitions were alternatives to the CDA competence model; only 2 represented potential career steps above the CDA. The sources used in the content analysis were a competency model for teacher of very young handicapped children (Ohio, 1974) and a job analysis for care-givers of preschool handicapped children.

The items from each source (competencies for the Ohio model; job elements for the Dory and Pickett analysis) were typed on individual cards for sorting. Then, the item cards for each source were sorted according to the 13 CDA functional areas. As a check on reliability, a random sample of 100 items were resorted; 84 percent of the sample were resorted correctly. Table 11 summarizes the frequencies and percentage sorted from each source.

Table 11

Frequencies for Content Analysis of Two Competency Lists*

(Percentages are in parentheses)

CDA Functional Area	Dory and Pickett	Ohio
1. Safe	3 (4)	9 (4)
2. Healthy	3 (4)	9 (4)
3. Learning Environment	1 (1)	13 (6)
4. Physical	2 (3)	3 (1)
5. Cognitive	3 (4)	14 (6)
6. Language	2 (3)	9 (4)
7. Creative	0 (1)	9 (4)
8. Self Concept	4 (5)	2 (1)
9. Individual Strength	2 (3)	13 (6)
10. Social	2 (3)	9 (4)
11. Group Management	2 (3)	7 (3)
12. Home-Center	14 (18)	14 (6)
13. Staff	13 (16)	21 (9)
Total Classified	51 (65)	132 (58)
Total Not Classified	28 (35)	96 (42)
Total Items	79 (100)	228 (100)

*from Pettygrove, 1980, page 65.

In the Ohio (1974) competency model, 58 percent of the items were sorted into one of the 13 CDA functional areas. From this it may be inferred that the CDA competencies are transferable to 58 percent of the Ohio competencies. However, it should be noted that the Ohio competence model also contained knowledge competencies defining academic subject matter areas, which could not be used in this analysis. In order to transfer into a job according to the Ohio model, the credentialed CDA would have to acquire competence in the 32 percent of the Ohio competencies not covered by the CDA. In addition, she would have to attain or document academic knowledge "competence" to which CDA competence has no demonstrated relationship.

A higher percentage of job elements in the Dory and Pickett (1977) analysis were sorted into CDA functional areas; 65 percent of the CDA competencies thus appeared transferable to this job analysis. CDA competencies were not transferable to a set of specialized skills for working with handicapped children, but were especially relevant to working with parents, program management, and integrating the handicapped child into a group of children.

Although based on only two sources, the importance of this content analysis should not be underestimated. With federal law PL 94-142, an increasing number of child care centers may be expected to enroll preschool handicapped children. Because these centers will serve heterogeneous groups of children with differing needs, child care center staff will need a broader set of competencies (Hirshorn and Umansky, 1977). To the extent that the CDA credential documents many of the competencies, it may give staff an advantage in moving into working with handicapped children.

The field of health and medical programs did not yield competence models for this study, but it may be a fruitful direction for inquiry in future research. One source (Silver and Ott, 1973) described a competency model for a health professional called the Child Health Associate. Although special technical training would be required, the competence of the CDA could transfer to supporting and educating parents, and meeting the child's social and emotional needs in preventive health programs as well as during medical treatment. Evidence already exists to support the validity of the Child Health Associate model; more research may describe the transfer of competencies.

The content analysis findings were combined with those from the career history field data (Table 5, page 51) to define a hypothetical career ladder. This ladder describes movement within and beyond child care center programs for persons who have demonstrated the CDA competencies. Figure 4 illustrates the hypothetical career ladder. Although it cannot (and must not) be used for career counseling, it may be useful in identifying areas for increased opportunity in child care work. It clearly documents the narrow range of opportunity and sex stereotyped nature of the career at this time.

The content analysis of competency lists may have further use as a way to identify training needed for already competent individuals to move into new occupations or new levels of a career.

Case Studies of State Regulations

The two states chosen for case studies represent several contrasts. Most important in initial selection was Minnesota's early recognition of the CDA credential in child care licensing, and California's nonrecognition. Rather than identifying a cause for recognition of the CDA credential, the

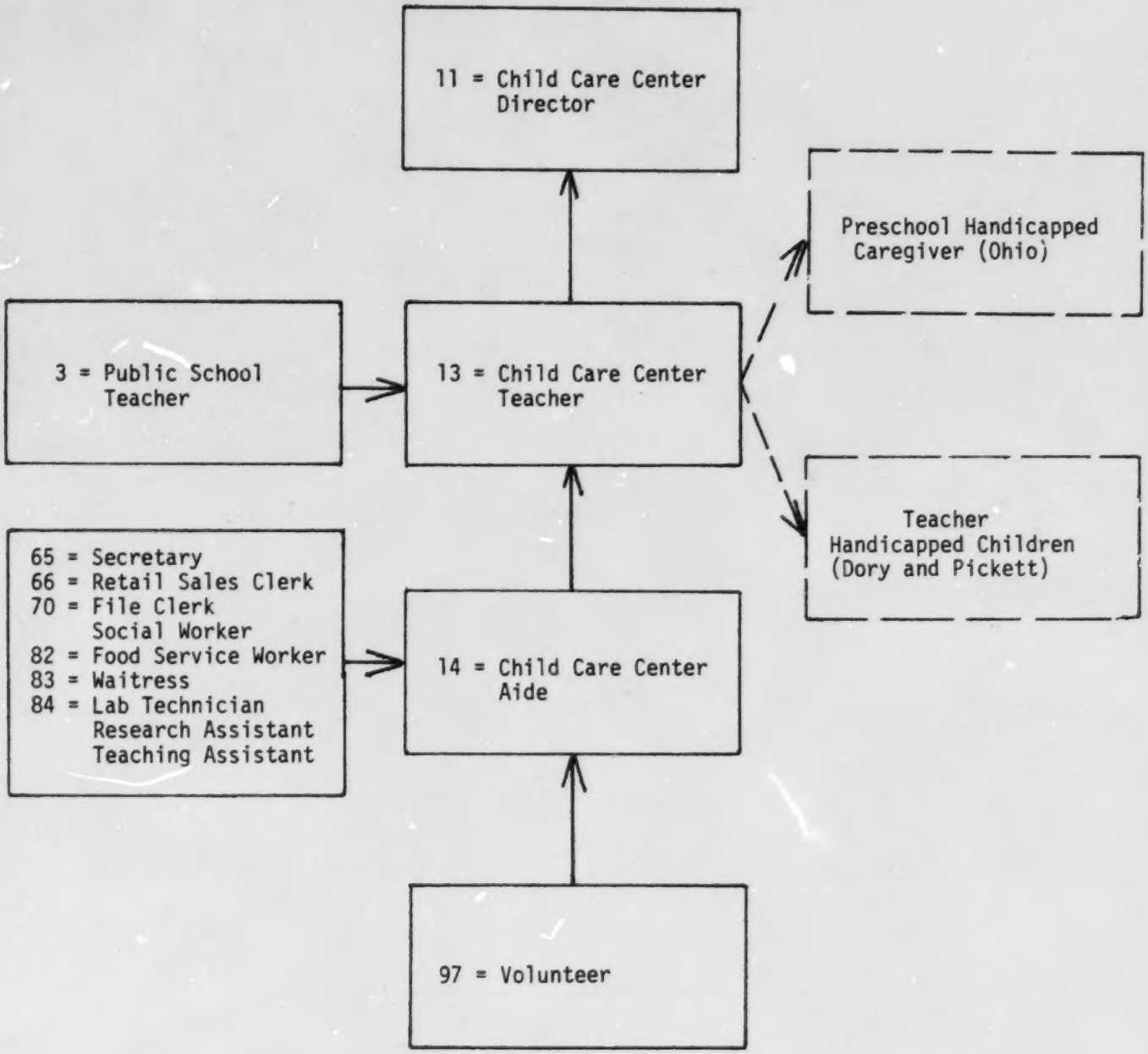
11 = Child Care Center Director
Preschool Handicapped Caregiver (Ohio)
3 = Public School Teacher
13 = Child Care Center Teacher
Teacher Handicapped Children (Dory and Pickett)
65 = Secretary
66 = Retail Sales Clerk
70 = File Clerk
Social Worker
82 = Food Service Worker
83 = Waitress
84 = Lab Technician
Research Assistant
Teaching Assistant
14 = Child Care Center Aide
97 = Volunteer

Figure 4

Hypothetical Career Ladder

(from Pettygrove, 1980, page 62)

case studies described two different patterns of training resources, professional involvement, and state policy. These patterns suggest how the CDA credential may become a feasible policy alternative in some but not all states.

Minnesota

In Minnesota, the CDA is one of six means by which a child care center can meet staff qualification requirements to gain a state license. The alternative staff requirements represent a range in education criteria from three courses minimum to at most a college degree in child development/pre-school-kindergarten. Experience requirements also range, and are inversely related to amount of education required, from 3,120 hours as an assistant teacher to no experience requirement for those with a nursery school teacher's state certificate. In other words, the CDA credential, based on no specific training requirement and approximately one year's experience, is an alternative for those who lack extensive education and experience (Minnesota DPW, 1977).

The time line (Figure 5) documents the steps by which the CDA was considered and adopted. In addition, it suggests that the CDA may have affected subsequent revisions in the state Department of Education's pre-school teacher certificate.

Informants referred to the success of the CDA in facilitating more restrictive staff requirements while keeping qualified persons on the job. In addition, the concept of the CDA as a middle level professional and the apparent success of credentialed people in Minnesota may have supported the concept of a two level preschool teacher certificate. Although the CDA is not recognized by the Department of Education, the development of the two level certificate may help credentialed CDAs gain easier access to a teaching certificate.

1959	At urging of professionals, teacher certification required for all programs called "schools". This certification handled by the State Department of Education.
1963	Minimal staff standards defined for non-school child care centers.
1971	Revision of child care center standards began.
1972	As the CDA assessment/credential was being developed, the State Day Care Standards Advisory Committee recommended it as a way to upgrade child care center staffing standards. CDA adopted as a standard when it was adopted by the Consortium in 1974.
1973	One of the state colleges received federal funds to develop a pilot project for CDA training.
1975	Department of Education began revision of early childhood teacher certification. Professionals in the field urged inclusion of an alternative to the four year college degree, to recognize middle level professional at work in early childhood school programs.
1978-79	Two level early childhood teacher certification under consideration: four year degree for pre-kindergarten teacher, plus two year degree (Associate of Arts) for pre-kindergarten associate.

Figure 5

Time Line, Minnesota Child Care Regulations and Policy Development

from Pettygrove, 1980, page 70

Informants for this case study represent many institutional affiliations, but they share an important professional one. Their common membership in Minnesota Association for the Education of Young Children (MAEYC) is evidence of the high level of cooperation among them and their agreement about the value of the CDA credential. This cooperation and agreement seemed an important factor in recognition. In addition to the long term commitment of MAEYC to child care center staff professionalization, the national organization (NAEYC) has actively supported and promoted the concept of a competency based credential.

The recognition of the CDA credential in Minnesota must also be viewed with reference to institutional needs and potential for change. Because the credential was first considered for child care center licensing under the jurisdiction of the Department of Social Welfare, proponents avoided opposition from public school teachers and the Department of Education. In addition, the Department of Public Welfare needed to upgrade standards which were viewed as inadequate. The CDA credential was not displacing another recognized standard; it was a practical way to raise the standard. Further, because the Department of Public Welfare had jurisdiction over child care centers but not preschools, the recognition of the CDA would have an immediate effect on only one part of the field.

California

The California case study offered contrasts beyond the variation in size, location, and cultural and geographical features. In spite of rather lengthy consideration and some controversy over the CDA credential, it has not yet been recognized as a standard in state child care regulations.

At the time of the case study, the state Commission on Teacher Preparation and Licensing (CTPL) was reviewing the CDA credential as one possible alternative in the revised Children's Center Permit regulations. The Children's Center Permit, revised in 1979 (Figure 6), is required for every teacher (one per ten children) in state funded programs. (The administration and regulatory jurisdiction for state funded programs is delegated to the State Department of Education by the state Department of Social Services.) The revisions reduced general education requirements, eliminated the requirement for a college degree, and increased child care coursework and work experience requirements. As a compromise to proponents of the CDA credential, some of the work experience requirement in the revision could be met by a field based assessment.

A committee of CTPL has worked for over one year to define guidelines for this field based assessment. The committee seems to intend to write guidelines which would accommodate several different assessment systems, including the CDA. The field based assessment is not replacing college credit requirements; a college degree is still required for a lifetime Children's Center Permit.

Reactions within the committee and from the field suggest a misunderstanding of the CDA credential and perhaps of competency based credentialing in general. A few criticisms have pertained to the validity of the CDA assessment. Most, however, have been concerns that a field based assessment, by reducing college credit requirements, would lower standards. Some critics attempted to equate the assessment with a set number of college credits. Others seemed to equate competence with years of experience, something desirable but less valued than academic training.

1972 Assembly Bill 99 transferred responsibility for all public funded child care programs to Department of Education. Created Office of Compensatory Education which later became Office of Child Development. Children's Center Permit (certificate) applied to all teachers in public funded child care centers.

1973 Full state funding replaced federal subsidy for the State Preschool Program. Licensing for child care centers established under the Department of Social Services, but delegated to the Department of Education for programs it administered.

1975 State appropriated $15 million to take the place of support from the federal Title XX program for child care for low income families. This resulted in approximately half the federally supported child care centers becoming fully state funded.

1977 Revision of Children's Center Permit regulations began. Some individuals (including some state legislators) urged adoption of CDA as one alternative. Opposition to the CDA came from several groups. Advisory committee in charge of the revision recognized need to include more alternatives in regulations, but did not include the CDA.

1979 Revised Children's Center Permit regulations adopted by Department of Education, including field-based assessment option. Field-based assessment committee created to develop standards.

Figure 6

Time Line, California Child Care Regulations and Policy Development

from Pettygrove, 1980, page 74

Compared with the Minnesota case, California's child care professionals are a very pluralistic community. In addition to the NAEYC affiliate (CAEYC), there are organizations representing community college educators, university programs, and different child care providers and ethnic groups. The strong diversity of the state, expressed in a well organized pluralism, may impede adoption of uniform standards.

The importance of the Children's Center Permit in California cannot be underestimated. Its importance is another impediment to change. Because it is regulated by CTPL and parallels public school teacher certification, one may expect more emphasis on academic requirements, and more resistance from teachers' organizations. Innovations will have broad implications because the permit applies to all state funded programs.

Finally, the value of the CDA in California must be viewed relative to the state's role in supporting child care and adult education. California's role in funding and regulating child care programs may increase resistance to accepting a standard which was developed at the federal level. Opponents questioned the need for an alternative like the CDA credential, given the availability of tuition free child care related courses. Some case study informants stated that the CDA credential is helpful in states where adult education is lacking, but that it is not as necessary in California.

The case study results demonstrate the need to evaluate the CDA credential with reference to child care professional organizations, funding, existing standards and patterns of jurisdiction, and resources supporting the attainment of academic credentials. The following general observations summarize the case study findings:

"1. The acceptance of a staffing standard includes concerns about the availability of training (can people meet the standard?) and pay and status (Can people be expected to invest in training for the rewards they will gain?). Thus the adoption of a credential in state regulations represents a compromise between professional ideals and labor market realities.

2. Professional organizations may work as special interest group promoting definitions of 'professional' and 'quality' that conform to members' knowledge and values.

3. The jurisdiction of relevant state agencies is a strong contributing factor in the acceptance of a credential as a standard.

4. The incorporation of a competency based credential in licensing, rather than in certification, may avoid conflicts over the educational requirements associated with existing credentials." (Pettygrove, 1980, pages 76-77)

The case study results of the two states are not easily comparable. Rather, they describe two unique patterns of response to an innovation in credentialing.

Limitations

The chief limitations of the study were described in the sections on research design, sampling, and methods. Some broader limitations, related to the definition of the research problem, will be described in this section.

The absence of a criterion seriously hampers inferences to be made from the research results. Added to the difficulty of measurement is the ambiguity about the meaning of competence for child care staff. The problem of selecting a criterion relates both to the framework used in the analysis and the expected performance level. It is not clear whether criteria should be defined in terms of performance (behaviors of the worker) or as outcomes

(qualities of the child care environment and indices of children's development). Outcomes are the ultimate purpose for competence. However, outcomes may not serve as valid criteria for competence assessment because they are dependent on many variables besides staff performance. Only one study (Ruopp et al., 1979) has related the CDA competence definition to outcomes. The study reported here provided only indirect evidence of performance. The problem of expected performance level also complicates criteria selection. Are the functional areas to be interpreted as for entry level performers or as evidence of excellence? The functional areas and assessment procedures do not address this question.

The apparent lack of fit between existing validation techniques and the CDA assessment also limits the inferences and conclusions of this study. The CDA assessment's unique methods are congruent with a humanistic and developmental philosophy of measurement. The assessment as formative evaluation seems to provide much helpful information in a useful context, but the utility and accuracy of the assessment can be empirically verified only by loose application of existing research methods.

In order to focus on the validity of the assessment, the design of this project excluded any consideration of the content of subjects' prior education and training. However, the results on access to the assessment suggest that content of training may be an important consideration. Such training may be helpful in preparing the Candidate for the assessment process, and learning during training and assessment may interact to result in unique patterns of performance. The CDA credential developed in tandem with many innovative CDA training programs. The apparent impact of the CDA credential

on child care quality may in fact be due to the combined impacts of training and assessment innovations.

The CDA credential, and the assessment on which it is based, is a system which functions in the real world. Its functioning depends on the interaction of institutions at the state and federal level; government support in research, development and funding; and recognition by potential CDA Candidates, child care employers, and child care programs. Limitations in research on the CDA credential arise when some elements of the system or its real world context are not considered or controlled. Because it is a system, one step in defining the research problem must be to specify the system's boundary. The CDA assessment may be viewed as a measurement of competence, as an innovation for career development in child care work, or (most broadly) as one policy alternative to improve the quality of child care.

Conclusion

In this concluding discussion, the results of the study will be integrated in order to address several major research issues.

Validity The findings from the written assessment based on the CDA competencies suggest that credentialed persons may perform better than their noncredentialed counterparts on some measures. Their performance was superior even when educational and ethnic differences were controlled. Although interesting and important, these findings should not be overemphasized. The assessment depends on statements about practice, not performance itself. It may be that the CDA assessment made Candidates more aware of desired practices, and gave them experience in stating a rationale for such practices.

Apparent inadequacies in the rating scale meant that job supervisor ratings could not be used as a criterion for validation. However, the ratings were used along with data from ratings by the credentialed subjects' assessment teams. The combined data resulted in significant average inter-rater correlations for all 13 CDA functional areas. Although the correlations did not meet levels expected for good reliability, the significant agreement among raters suggested that reliability is attainable in the CDA assessment procedure.

Interview data on attitudes and experiences related to assessment suggested that access problems may exist. Potential candidates may have difficulty finding out and preparing for assessment in the absence of special training programs. Further, the assessment process may be biased toward persons who tolerate observation, keep and use written records of their performance at work, and can work cooperatively with an assessment team. Although no adverse impact has been demonstrated, future evaluators should consider whether such features of the assessment or its support system interfere with access by some competent Candidates.

Data on subjects' perceptions of the environment were analyzed as a test of the construct validity of the CDA assessment. According to one theoretical perspective (White, 1959 and Bandura, 1977), competence is manifested in the individual's motivation toward efficacy experiences. Self perceptions of competence or influence should be exhibited by competent workers. The Day Care Forces Sort data failed to support these predictions; the reasons for this failure may stem from sampling and measurement error, from variations in the subjects' work environments, or from the absence of a link between the CDA credential and an underlying construct of competence.

Although other interview data indicated some more positive attitudes among credentialed subjects, both groups of subjects shared many positive attitudes about their work's importance and its intrinsic benefits.

Career Development The crucial finding of this study was the absence of concrete benefit for credentialed subjects in terms of pay, job security, or promotion. The absence of pay benefits may be due to a ceiling effect in the economics of child care. However, wage differentials related to education level indicated that employers of credentialed subjects did not recognize the CDA over other promotion criteria at the time of this study.

Subjects consistently reported positive attitudes supporting their view of child care as a profession. Career history and preference data indicated that child care was the preferred choice for many subjects. For many, it may be the choice among a narrow range of low status, unrewarding jobs.

A content analysis supplemented the career history analysis so that a hypothetical career ladder could be drawn. The potential transfer of CDA competencies was demonstrated for two analyses of child care for handicapped children. This transfer demonstrates the potential for a career opportunity for those who demonstrate the CDA competencies.

The career development potential of the CDA credential depends heavily on its recognition in child care regulations. Such regulations are an important incentive for staff to earn the credential, and for employers if they are to recognize it in lieu of other selection and promotion criteria. Case studies of two states' regulatory responses to the CDA documented the complexity of recognizing it. Beyond the question of its validity are the demands and viewpoints of special interest groups and professional organizations,

the varying needs of child care providers, and the resources to train and support potential CDA candidates. The need for a valid staff qualification standard is only one of several factors influencing a state's policy.

During the course of this study, two developments occurred which may have a major impact on the long term career value of the CDA credential. These were beyond the scope of the study, but are germane and should be noted.

One development was a set of administrative and fiscal problems which kept the CDA Consortium out of operation for more than half of fiscal year 1980. Critics in the field have questioned whether a large bureaucracy like the Consortium can continue to function, let alone remain responsive to their needs (e.g., Voice for Children, 1980). If the system's viability is questioned, its career value could be affected. The validity of the assessment will be irrelevant if problems of cost and management are not solved.

A second development is the day care regulations promulgated by the Department of Health and Human Services for all federally funded child day care programs. These regulations require that each caregiver have a "nationally recognized child development credential appropriate for the age of the children," or be enrolled in special training by April 1, 1981 (Federal Register, 1980). When instituted, these regulations could create an increased demand for the CDA credential. By requiring an age appropriate credential, they could encourage the extension of the CDA competence assessment procedure to caregivers of infants and school aged children.

Summary For purposes of clarity, these results and discussion of the diverse components of the project were separately considered as validity and career development. The two in fact are inseparable, for both are necessary to identify and retain qualified adults in child care programs. This study has provided some indirect evidence to support the validity of the CDA assessment, and to suggest ways in which validity might be improved. Career development in child care may not be a realistic expectation because of the lack of resources committed to staff development, staff salaries, et cetera. Proponents of the CDA credential who would enhance its career development value must address the economic, social and political implications of credentialing.

RECOMMENDATIONS FOR FUTURE RESEARCH

The results of this study strongly indicate the need to view credentialing within a very broad systems perspective. The validity and career development potential of an assessment/credential system cannot be judged apart from the social context in which it is implemented. The perceived value of an occupation, and important labor market variables, may depend on intervening variables such as traditional sex typing of work roles. The validity of a credential, in terms of its prediction of successful performance, may relate to aspects of the work environment which are beyond the individual worker's control.

A critical issue for future research should be the success of the CDA credential in influencing state child care staff regulations. The subsequent impact of such influence on program quality must of course be included as one outcome variable. At the same time, training institutions, professional organizations and other special interest groups may offer diverse definitions of competence which should be considered in the validity analysis. The perceived availability of qualified workers and/or relevant staff development resources may be crucial variables. An increase in economic resources may increase the career development potential of the CDA, by allowing programs to differentially reward staff who provide evidence of competence. At the same time, increased resources and improved evaluation methods for all aspects of the child care program may make staff performance a less critical variable in overall program quality.

Some findings of this study raised the issue of professionalism as an aspect of the perceived value and career development potential of a credential. Although one of many intrinsic and symbolic benefits of child

care, a professional image does not appear to be associated with differentials in pay or occupational mobility. This problem is not unique to child care; England (1979) has documented the disparity between pay and status for many woman-dominated occupations. Her research also described the existence of separate by equal status hierarchies for men and women which tend to restrict women's occupational mobility and access to the most influential and powerful positions in society.

Child care may offer the setting for a natural experiment on status, occupational mobility, and pay as dependent variables affected by policy alternatives which influence the variables of credentialing, education requirements, and sex of the worker. A study comparing states where different policies produce measurable differences in these variables could provide useful data on questions such as the following.

1. What is the effect of a changing sex distribution for workers in a given occupation on status and pay levels?
2. How does increasing the education requirements for an occupation affect status, pay and occupational mobility? In a sex typed occupation, do such requirements differentially affect men and women?
3. When education and experience requirements are replaced by a competency based standard, what are the effects for status, pay and occupational mobility? In a sex typed occupation, do such changes in requirements differentially affect men and women?

As states upgrade and modify child care regulations, especially in response to federal day care regulations, their policy decisions will result in a natural manipulation of variables relevant to many career development questions.

In the competence definition of the CDA assessment/credential system, the competencies and functional areas refer to job elements and observed outcomes of performance. Competence must be inferred from observations of qualities in the work environment and children's experience, as well as from the Candidate's behavior. This approach to defining competence requires less conceptual sophistication, so it may be more useful for non-professional evaluators such as the CDA assessment team members. However, it creates methodological problems; the criteria must be sufficiently specific to enhance reliability but general enough to accommodate different assessment contexts.

The alternative to a job element competence definition is the development of generic competencies. Generic competencies appear to be more conceptually sophisticated, and may be more difficult to define and measure, to the extent that they are abstractions from the actual performance of an individual in the workplace. However, as the work of Huff et al. (1980) indicates they may tap more important characteristics of the individual, as well as being transferable across setting and perhaps even occupations.

This question, as well as the validity of particular credentialing approaches, might be assessed by evaluating the comparative utility of different approaches to competence definition. The potential for such a comparison exists where child care staff enroll in competency based education programs. In some cases, the same individuals may have been evaluated both on generic competencies (in the course of their education) and on specific competencies (as they attempted the CDA assessment). The possibility of comparing two types of competency ratings within individuals would afford a very powerful research design for the purposes of validation. Potential

subjects might be drawn from a CDA training program which included generic competencies in its curriculum, or from the day care paraprofessional students in the College for Human Services.

Validity research must ultimately be criterion related. Future research on the CDA assessment/credential system must fill this obvious gap in the existing literature. However, findings from the most relevant body of research, that on performance based teacher education, indicate the inadequacy of current methods for identifying criteria (Huff et al., 1980). Although teacher performance must relate in some way to pupil outcomes, the complexity of such outcomes has frustrated most attempts to establish empirical relationships. The research problem will no doubt be even greater for child care workers, whose work environments are more diverse than those found in public school classrooms. The many outcomes, including the development of individual children, the needs of client families, and the expectations of public policy, defy simple definitions. Any research designed to test criterion or predictive validity must account for socioeconomic and philosophical variations in the child care program, its workers, and the population served.

This research has demonstrated the utility of existing methods such as the case study for generating insights about validity and career development potential. Subsequent research will depend on highly sophisticated designs which can produce reliable findings without sacrificing the philosophically unique methodology of the CDA assessment procedure. Survey methods and testing appear more sophisticated and offer impressive empirical findings, but may lack the sensitivity necessary in the exploratory phase of research. Empirical approaches do allow for control of idiosyncratic and chance occurrences, however.

The questions raised in the discussion of research findings are not directly transferable to the designs of future research. However, they are crucial questions which should be addressed in some way by that research.

DISSEMINATION OF RESEARCH FINDINGS

The strategy for dissemination rested on two assumptions.

1. The diverse research methods and resulting findings will be of interest to an equally diverse audience. Interpretation of the findings may have unique implications for child care policy, licensing standards, staff development programs, and the practice of particular child care workers.

2. The exploratory and/or descriptive nature of the data precluded conclusive statements about results. The findings should generate both questions and answers in their interpretation by the audience.

These assumptions led to the use of several different dissemination methods which would contact specific parts of the audience. Some dissemination was done while research was in progress, to encourage examination of policy issues during the early stages of recognition of the CDA credential and related policy developments. Initial presentations of the findings avoided conclusive or judgmental statements as well as theoretical arguments. Instead, they encouraged readers to generate alternative conclusions and to relate these to applications of the CDA credential. Subsequent publications are planned to give more detailed discussions of findings and more consideration for relevant theory.

The principal methods for dissemination were presentations at professional meetings, a summary monograph report, consultation with state agencies, and journal articles.

Presentations at Professional Meetings

The paper presented at the Women and Society Conference (Pettygrove, 1979a) was primarily concerned with child care as an occupation for women,

and the impact of the CDA as one of several possible policy innovations to improve the quality and quantity of child care. The paper by Pettygrove and Raikes (1979), presented at an annual meeting of child care professionals, was designed to review the CDA credential's impact on identifying and upgrading staff qualifications. The paper presented at the American Educational Research Association (Pettygrove, 1979b) addressed the issue of conventional meanings of validity and proposed a broader definition as necessary to properly evaluate an assessment/credential system like the CDA. A fourth paper was presented at a special "CDA Day" in a session on implications of the CDA assessment/credential system for licensing and certification (Pettygrove, 1979c). In addition to these papers, a symposium is being planned for the Society for Research in Child Development 1981 Biennial meeting. This symposium will address the development of competence in children, in young adults, and in adults who work with children. The consideration of competence development by three different researchers should contribute to understanding the meaning and measurement of competence.

Summary Report

The monograph format was chosen to accommodate a comprehensive treatment of the data, and to reach persons who would not be contacted through the papers presented at professional meetings or in journals.

Although the report was comprehensive and lengthy, it was designed to be highly readable. In addition to avoiding jargon wherever possible, the report included examples, anecdotes, and even drawings to encourage readers. Statistics were used to support arguments wherever appropriate, but readers should not need an understanding of statistics to extract meaning from the report.

The report was sent to persons concerned with child care regulations, child care program development, and child care staff development. The report will be available after the end of the grant from the Child Development Training Program at Iowa State University. Availability of the report will be announced through ERIC.

State Agencies

One target audience for the summary report is the state child care licensing and certification agencies. In addition to increasing awareness about alternatives, the summary report may be the first step toward consultation between the researchers and state officials. For example, Dr. Pettygrove is meeting with a committee of the California's Teacher Preparation and Licensing Commission to discuss the implications of the research. The purpose of consultation is not to advocate adoption of the CDA system. Rather, research on the CDA may serve as a contrasting example to encourage more critical analysis of existing systems.

The research findings have been shared with agencies such as the National Center for the Study of Professions. Contact with researchers involved in licensing innovation is an indirect form of dissemination to state agencies.

Journal Articles

The articles submitted for publication will present more intensive reviews of selected aspects of the research. They will be a bridge from the very pragmatic issues of credentialing and career development to general concerns in the child care field and perhaps even theory. At this time, four articles are planned:

1. An article on the problem of defining and measuring competent performance will be submitted to a journal for child development/early childhood practitioners (e.g., Young Children).

2. A critique of the CDA assessment/credential system as a way to meet staff training needs will be submitted to a journal for child care program administrators and developers (e.g., Child Care Quarterly).

3. An article on the problem of women's career development in woman-dominated and sex typed occupations will be submitted to the Home Economics Research Journal.

4. An article on the relations between competent performance and motivational aspects of adult development will be submitted to a journal concerned with employee performance in the helping professions.

The summary report and presentations at meetings are complete, except for the planned SRCD symposium. The articles will be submitted for publication by June 1981.

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Appendix A

Case Study Informants

Minnesota

Erna Fishhaut
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University of Minnesota Institute for Child Development

Dr. Dan Gartrell
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Bemidji State College

Mary Lou Gilstead
Program Director, Early Childhood Studies
University of Minnesota Continuing Education and Extension

Velma Lehman
Consortium Representative and Ph.D. candidate in Vocational Education
University of Minnesota

Cheryl Nyhus
Supervisor, Non-Residential Licensing
Minnesota Department of Public Welfare

June Smith
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California

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Katie Gerecke
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Carolyn Miller
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Dr. June Sale
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Dr. Renuka Sethi
Head, Child Development Department
California State University
Bakersfield

Dr. Celia Cota-Robles Suarez
Early Childhood Education
California State Polytechnic University
Pomona

Dr. Barbara J. Tardef
Consultant
Commission on Teacher Preparation and Licensing

Appendix B

Interviewers by State

Illinois

Nancy Gaumer
Catherine McClelland
Donna Stoddard

Indiana

Patricia Turner
Jeanette Webster

Iowa

Marilyn Giese
Willa Pettygrove[a]
Helen Raikes
Alice Woods

Kansas

Patricia Schilling[a]
Elizabeth Ytell[b]

Michigan

Jean Garnett[b]
Marsha Rysztak
Elaine Williams

Minnesota

Joan Allen
Judith Davisson
Marcia Pertuz

Missouri

Patricia Browder[b]
Beth Granberg
Margaret Jones
Margaret Walker[a]

Nebraska

Linda Frost
Carol Mollard[b]

Ohio

Carol Bodeen[a]
Carla Dietch[a]
Kay Douglas
Mary Grierson[b]
Sandra Hendricks[b]
Sherry Lenhart[b]

Wisconsin

Barbara Lancelot
Pauline Lawton

[a]Interviewer 1978 only.
[b]Interviewer 1979 only.